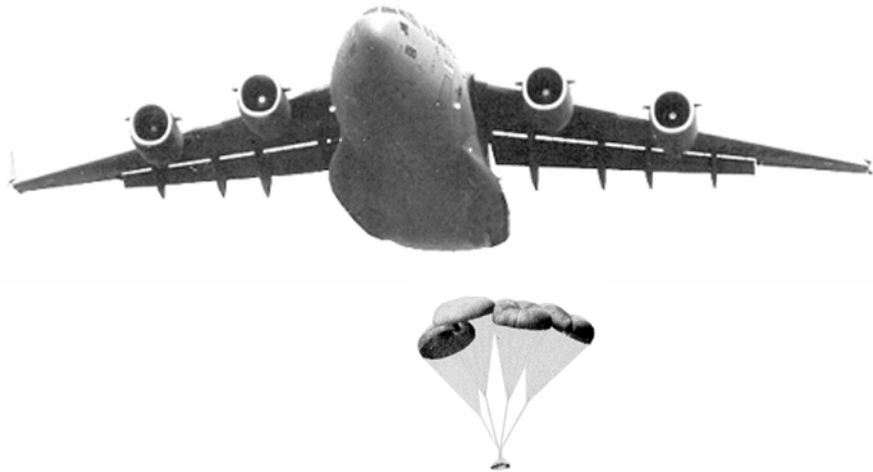




**AIRDROP OF SUPPLIES AND EQUIPMENT:
RIGGING FORWARD AREA REFUELING
EQUIPMENT (FARE) AND ADVANCED
AVIATION FORWARD AREA REFUELING
SYSTEM (AAFARS)**



JUNE 2003

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**HEADQUARTERS
DEPARTMENT OF THE ARMY
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FIELD MANUAL
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NO. 13C7-1-19

HEADQUARTERS
DEPARTMENT OF THE ARMY
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WASHINGTON, DC, 10 June 2003

Airdrop of Supplies and Equipment: Rigging Forward Area Refueling Equipment (FARE) and Advanced Aviation Forward Area Refueling System (AAFARS)

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Preface

This manual tells and shows how to prepare and rig the following configurations of the Forward Area Refueling Equipment (FARE) Systems, the 4-inch, 350-GPM Wheel-Mounted Pumping Assembly, and the Advanced Aviation Forward Area Refueling System (AAFARS) for low-velocity airdrop from a C-130, C-141, C-17, and C-5 aircraft.

User Information

The proponent of this publication is HQ TRADOC. You are encouraged to report any errors or omissions and to suggest ways of making this a better manual. Army personnel, send your comments on DA Form 2028 directly to:

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Introduction

This manual shows and tells how to rig the forward area refueling equipment (FARE), to include the rigging of hazardous material--gasoline, JP4, and diesel fuel. The FARE is rigged with the following:

Trailers. M101, M101A1, 3/4-ton, two-wheel trailers for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Two Fuel Drums. Two 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Seven Fuel Drums. Seven 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Vehicle. M998, 1 1/4-ton truck (HMMWV) for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

This manual shows and tells how to rig the 4-inch, 350 GPM wheel-mounted pumping assembly, to include the rigging of hazardous material-- gasoline, JP4, and diesel fuel. The 4-inch, 350-GPM wheel-mounted pumping assembly is rigged with the following:

Pumps and Separators. Two 4-inch, 350-GPM wheel-mounted pumping assemblies and two separators are rigged for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Three Fuel Drums. Three 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Four Fuel Drums. Four 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Five Fuel Drums. Five 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Six Fuel Drums. Six 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

This manual shows and tells how to rig the Advanced Aviation Forward Area Refueling System (AAFARS), to include the rigging of hazardous material-- gasoline, JP4, and diesel fuel. The AAFARS is rigged with the following:

Three Fuel Drums. Three 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Four Fuel Drums. Four 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Five Fuel Drums. Five 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Six Fuel Drums. Six 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

Seven Fuel Drums. Seven 500-gallon collapsible fuel drums for low-velocity airdrop from C-130, C-141, C-5, and C-17 aircraft.

The following conditions must be met when rigging these loads:

CAUTION:

There must be no more than 432 gallons of liquid in each drum when rigged for low-velocity airdrop. Do not pressurize drums with air.

Hazardous Material. When included as a part of these loads, fuel must be packaged, marked, and labeled as described in AFMAN(I) 24-204/TM 38-250.

Weight. Each drum of fuel **MUST** be weighed to learn its exact weight, as the drum has no gauge to measure the liquid content. For computing liquid weight per US gallon, 6 pounds are used for gasoline, 6.4 pounds for JP4 fuel, 6.7 pounds for JP8 fuel, and 6.68 pounds for diesel fuel. When empty, the drum weighs 250 pounds.

CAUTION:

Because the fuel drum is flexible, it will rebound upon ground impact and the lashings may be broken. This could free the drum and allow it to roll off the platform and create a possible hazard in the immediate area.

Manuals. A copy of this manual must be available to the joint airdrop inspectors during the before- and after-loading inspections.

NOTICE of EXCEPTION:

The procedures in this manual for installing the Suspension Sling Safety Ties may differ from those in FM 4-20.102/ NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. An exception to FM 4-20.102/ NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 is granted. The procedures in this manual **MUST** be followed.

Chapter 1

Rigging FARE For Low -Velocity Airdrop On Type V Platform

SECTION I - RIGGING FARE WITH TWO 500-GALLON FUEL DRUMS

DESCRIPTION OF LOAD

1-1. The Forward Area Refueling Equipment (FARE) is rigged on a 12-foot, type V platform with two G-11 cargo parachutes. There are two collapsible fuel drums as an accompanying load. When empty, each drum weighs 250 pounds. Each drum is filled with 432 gallons of liquid. Overall length is 162 inches. Width is 108 inches. Height is 70 inches. Center of balance is 72 inches

- Notes:**
1. For drums filled with a liquid other than gasoline, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

Table 1-1. Weight of Drum When Filled with Liquid

Fuel	Weight Per Gallon	Total Weight of Drum with 432 Gallons of Liquid
Gasoline	6 Pounds	2,842 Pounds
JP-4	6.4 Pounds	3,015 Pounds
JP-8	6.7 Pounds	3,145 Pounds
Diesel	6.68 Pounds	3,136 Pounds
Water	8.3 Pounds	3,835 Pounds

PREPARING PLATFORM

1-2. Prepare a 12-foot type V airdrop platform using four tandem links and 40 tie-down clevises as shown in Figure 1-1.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

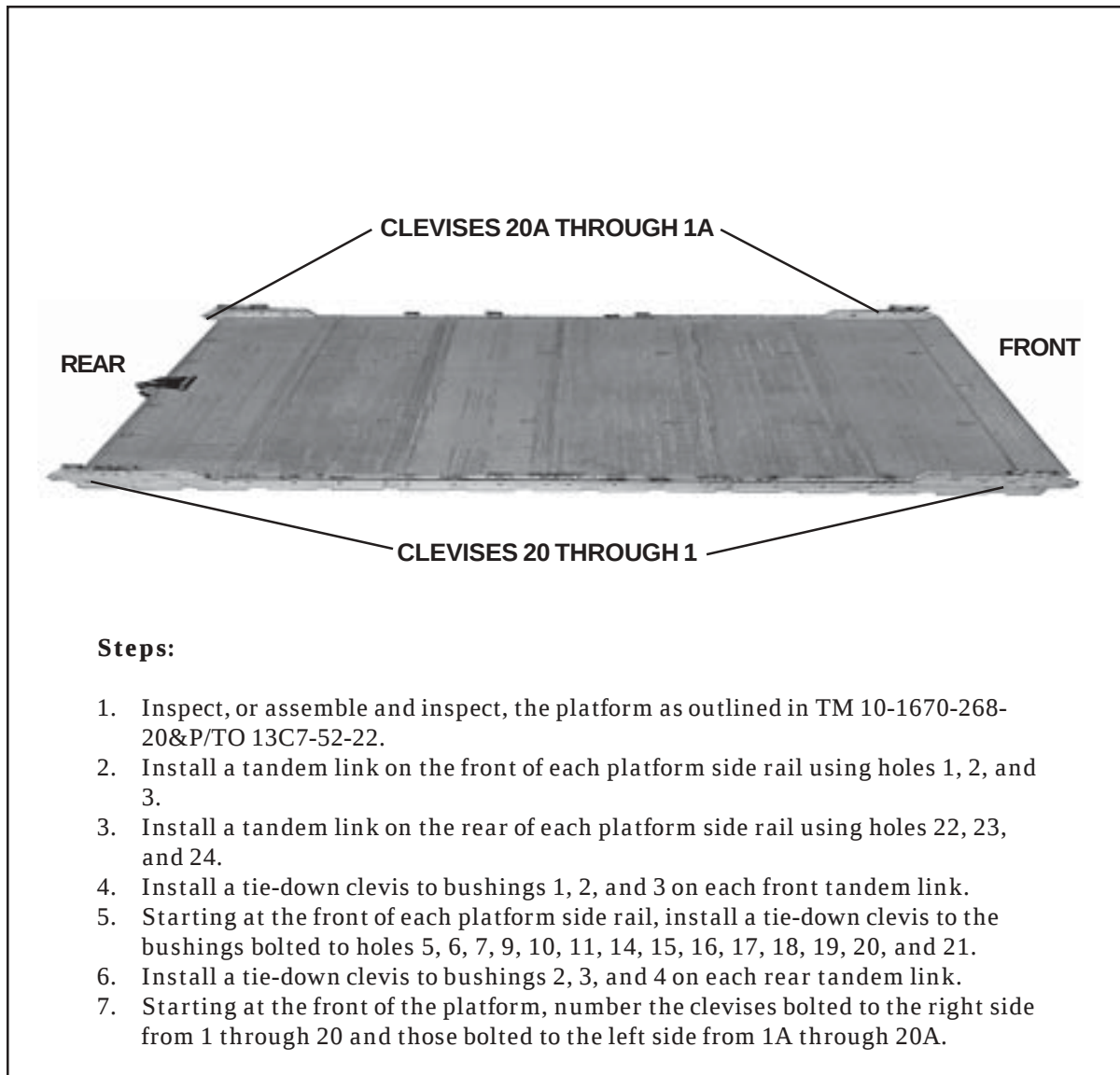


Figure 1-1. Platform Prepared

PREPARING HONEYCOMB

1-3. Place eight 96- by 36-inch pieces of honeycomb on the platform as shown in Figure 1-2.

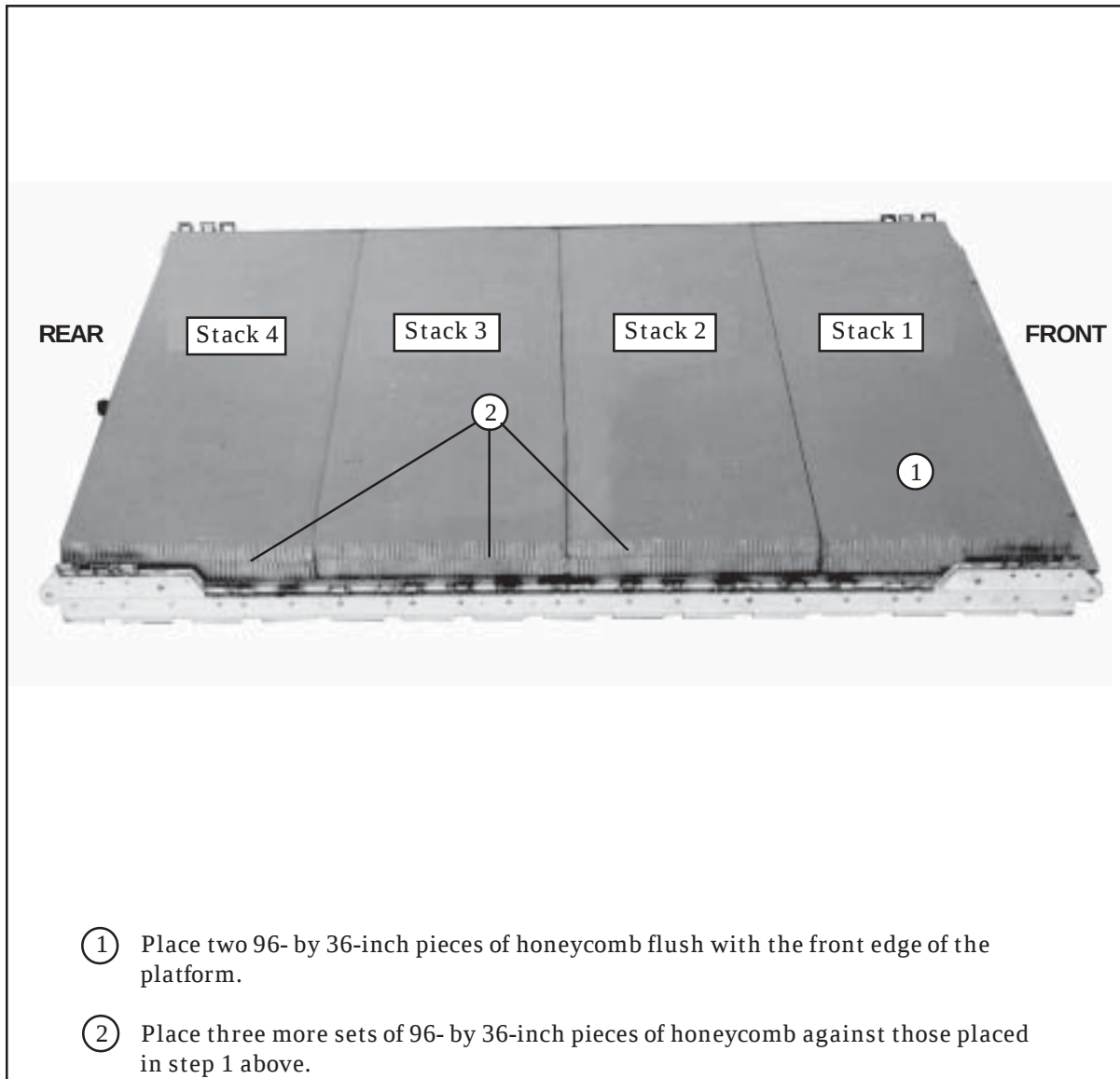


Figure 1-2. Honeycomb Placed on Platform

BUILDING CONTAINER FOR FARE

1-4. Build the container to stow the FARE as described below and as shown in Figure 1-3.

a. **BUILDING TOP.** Build the top for the container as shown in Figure 1-3.

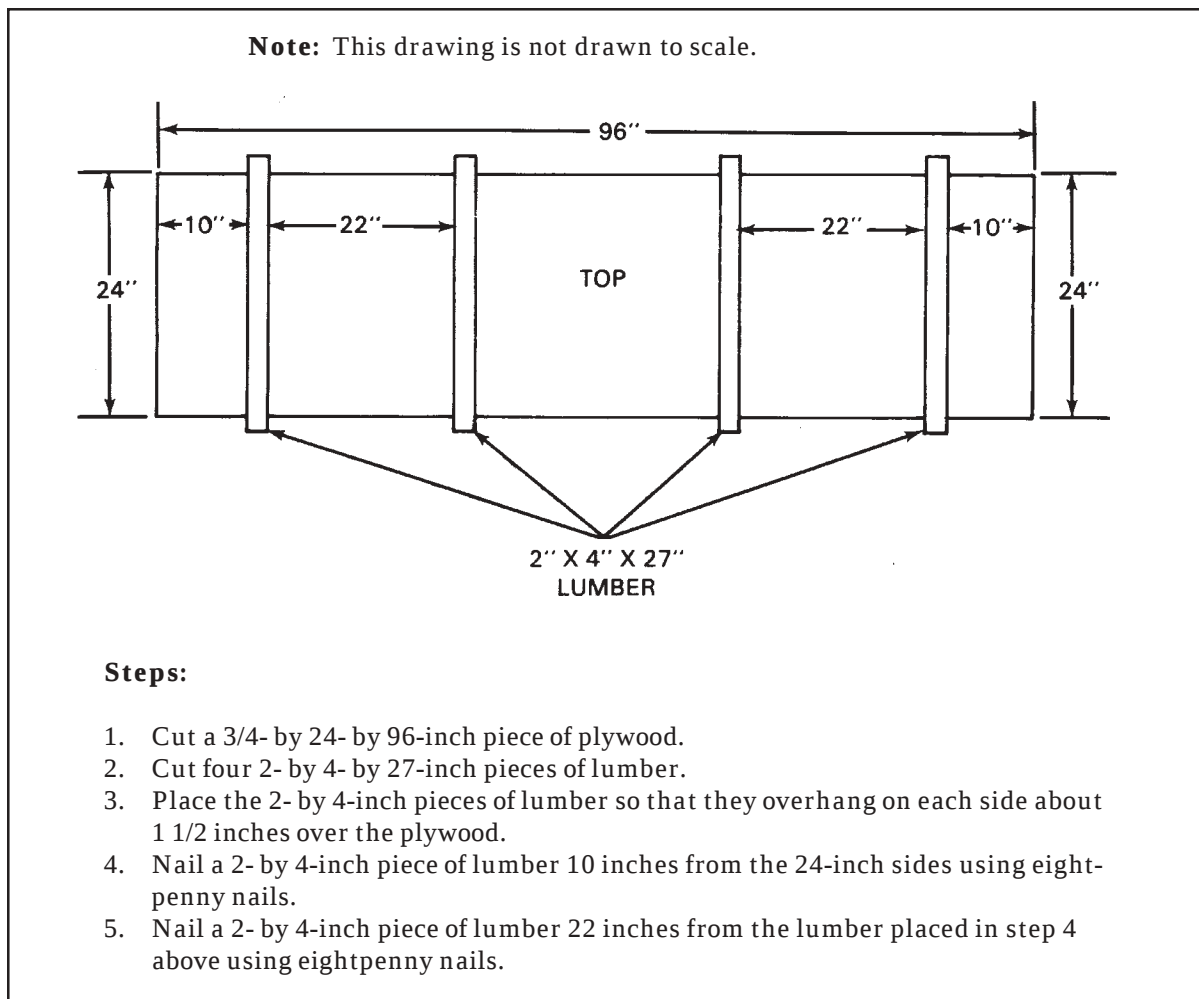


Figure 1-3. Top for FARE Container Built

- b. BUILDING SIDES.** Build the sides for the container as shown in Figure 1-4.

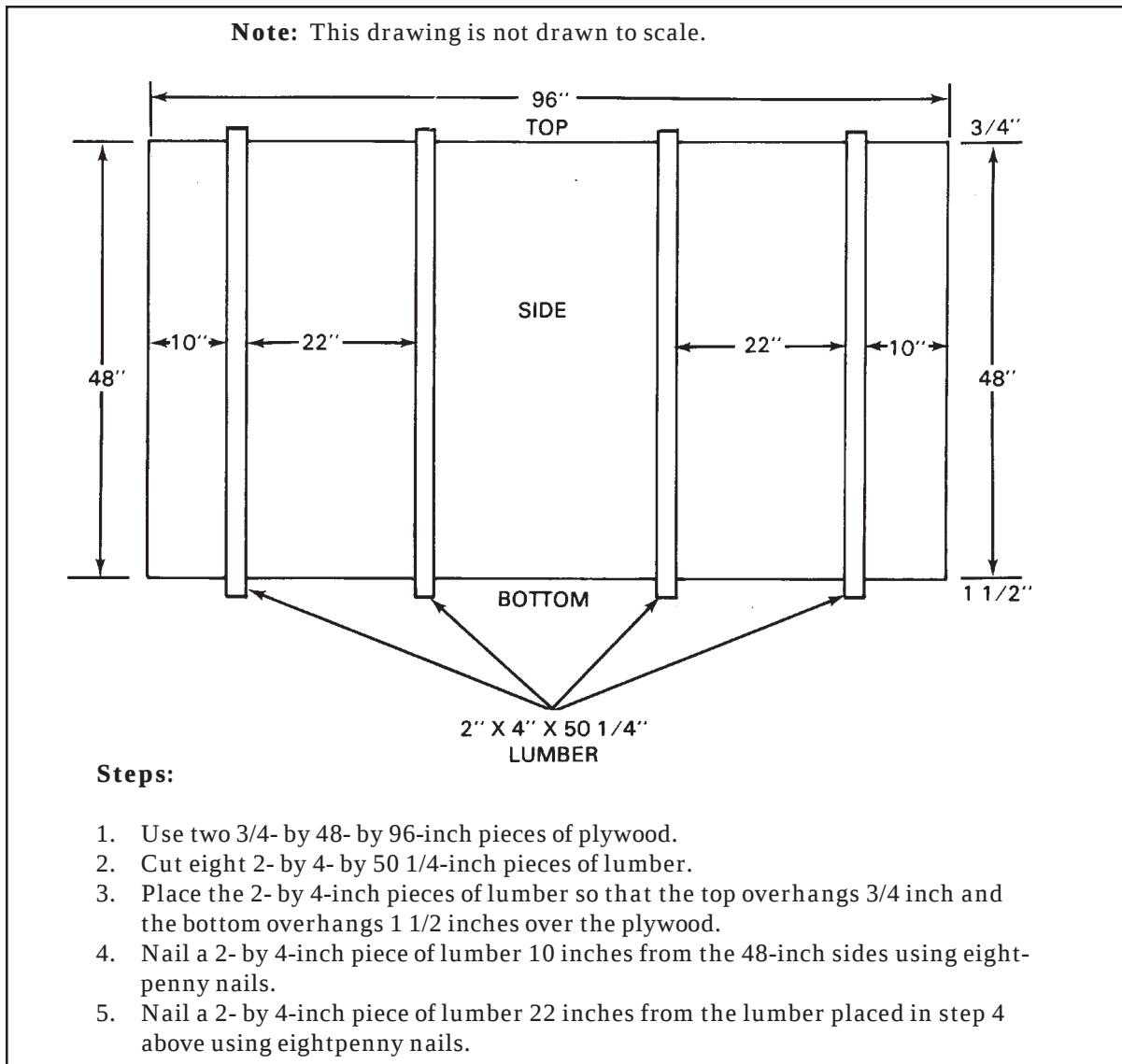


Figure 1-4. Sides for FARE Container Built

- c. **BUILDING BOTTOM AND ENDS.** Build the bottom and ends for the container as shown in Figure 1-5.

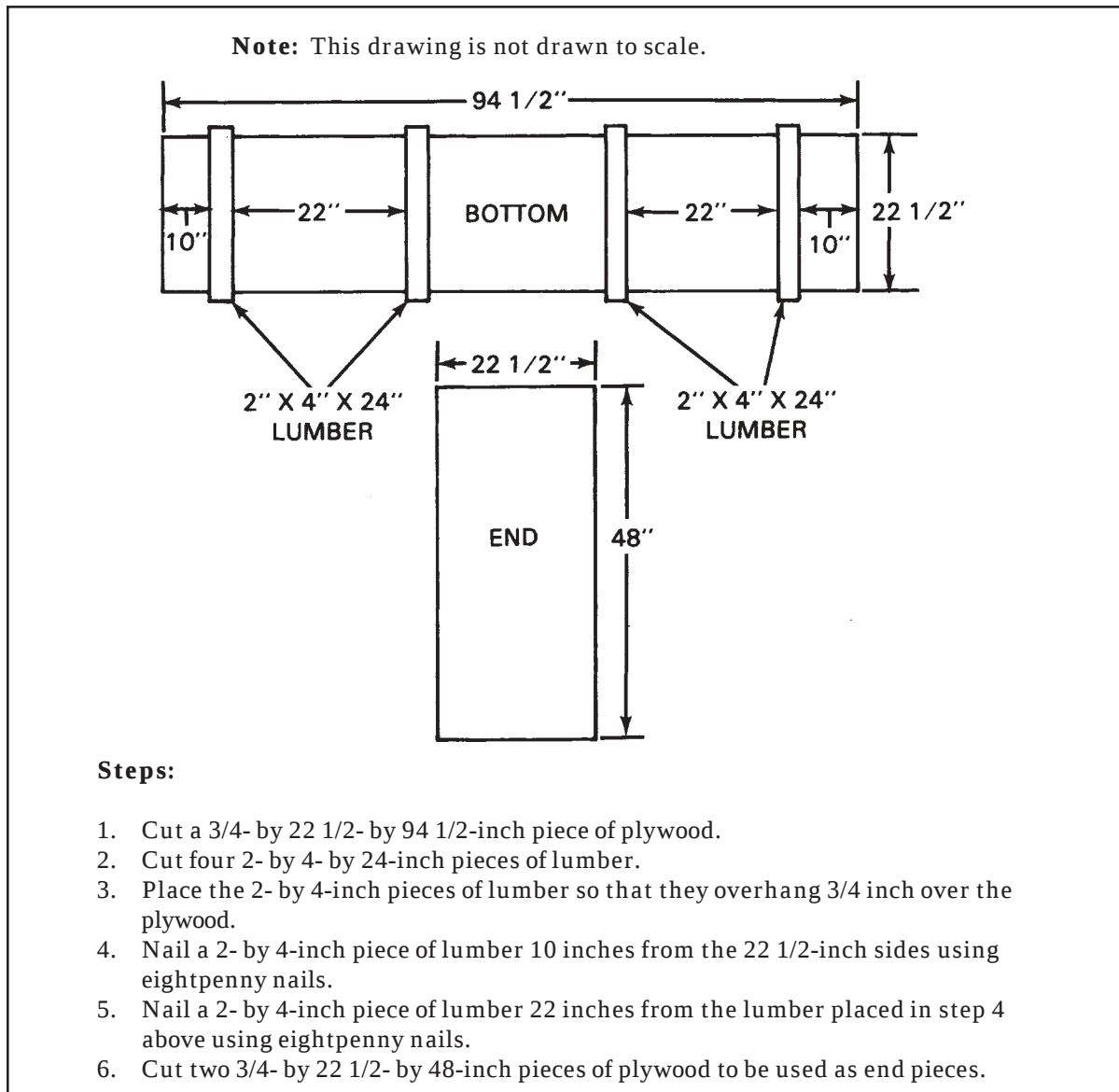


Figure 1-5. Bottom and Ends for FARE Container Built

- d. **ASSEMBLING CONTAINER.** Assemble the container for FARE as shown in Figure 1-6.

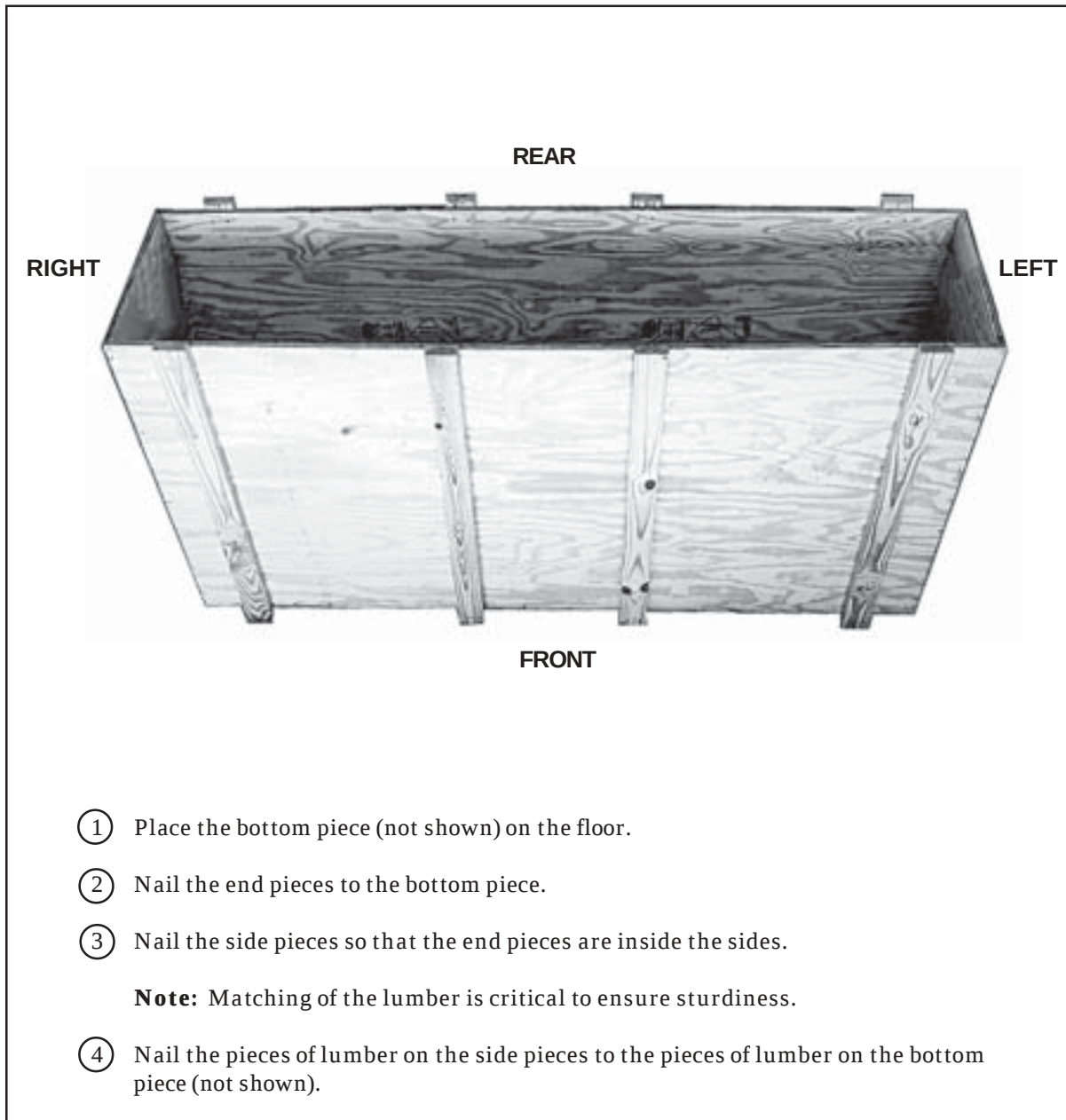


Figure 1-6. Container Assembled

PREPARING AND STOWING FARE IN CONTAINER

1-5. Prepare the components of the FARE and stow them in the container as described below.

- a. **PREPARING DISCHARGE HOSE FRAME ASSEMBLY.** Prepare the discharge hose frame assemblies, and stow them in the container as shown in Figure 1-7.

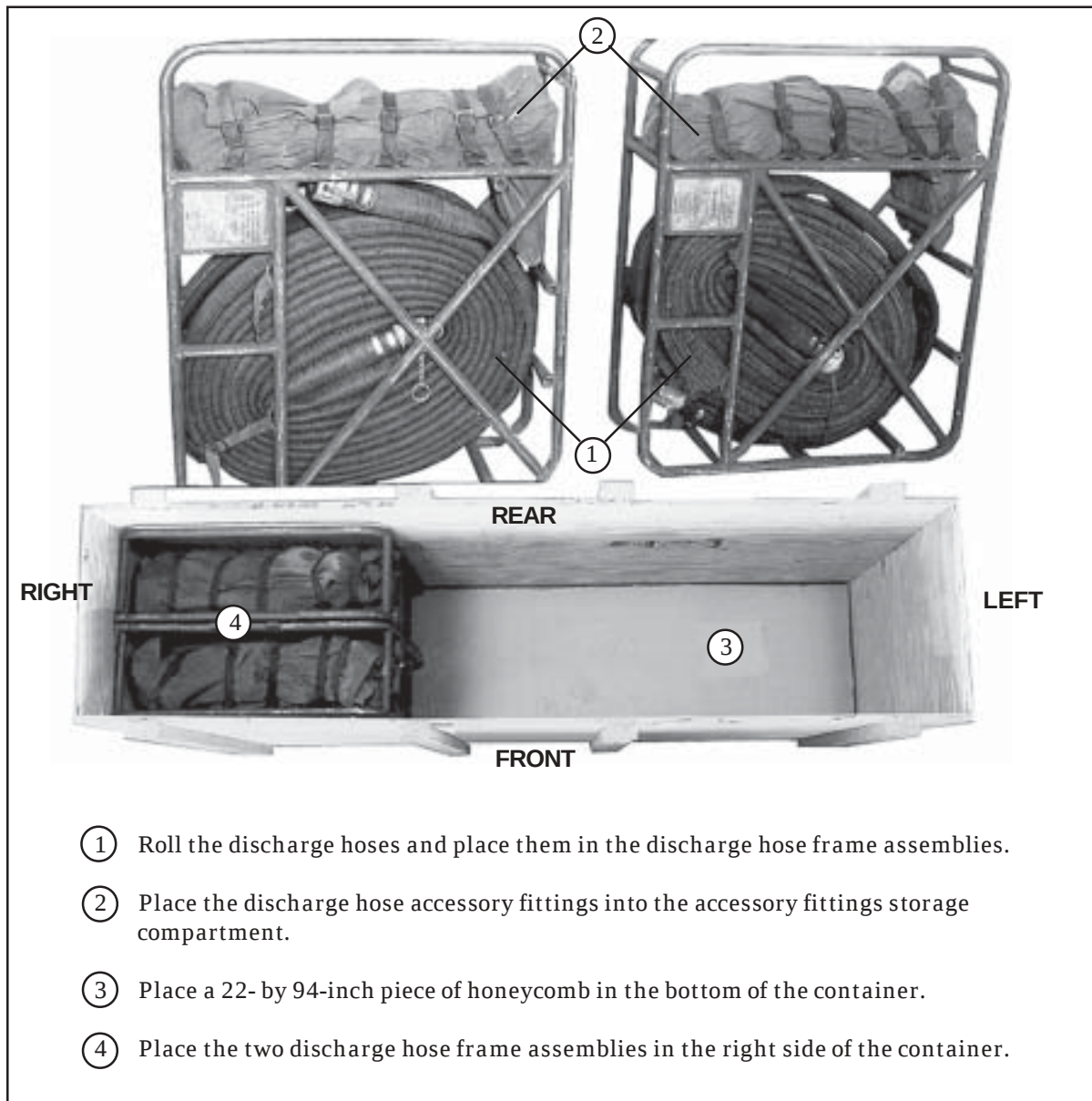


Figure 1-7. Discharge Hose Frame Assemblies Prepared and Stowed

b. PREPARING FILTER/SEPARATOR ASSEMBLY. Prepare the filter/ separator assembly and stow it in the container as shown in Figure 1-8.

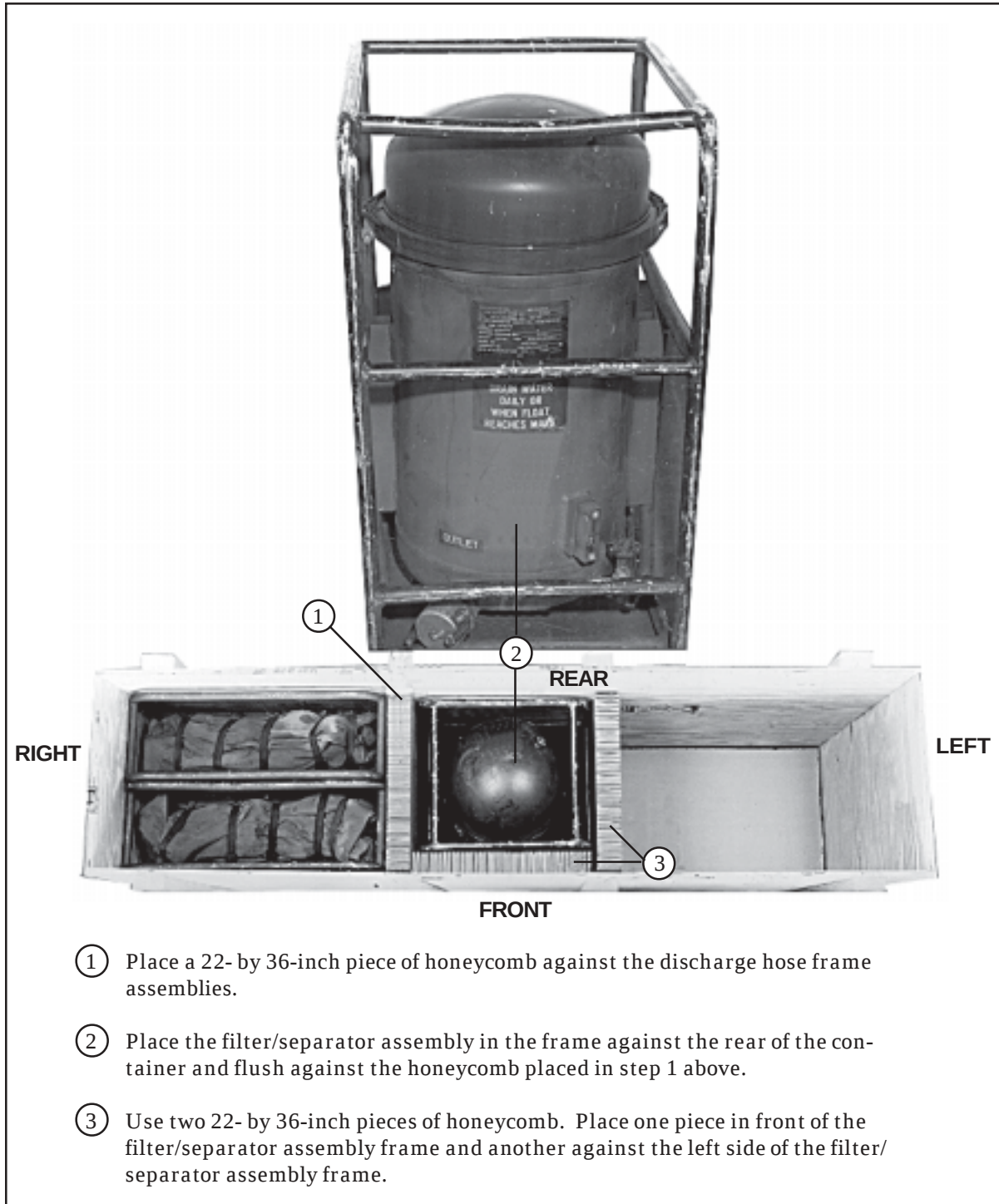


Figure 1-8. Filter/Separator Assembly Prepared and Stowed

c. PREPARING PUMP/ENGINE ASSEMBLY. Prepare the pump/engine assembly for stowing as shown in Figure 1-9 and stow it in the container as shown in Figure 1-10.

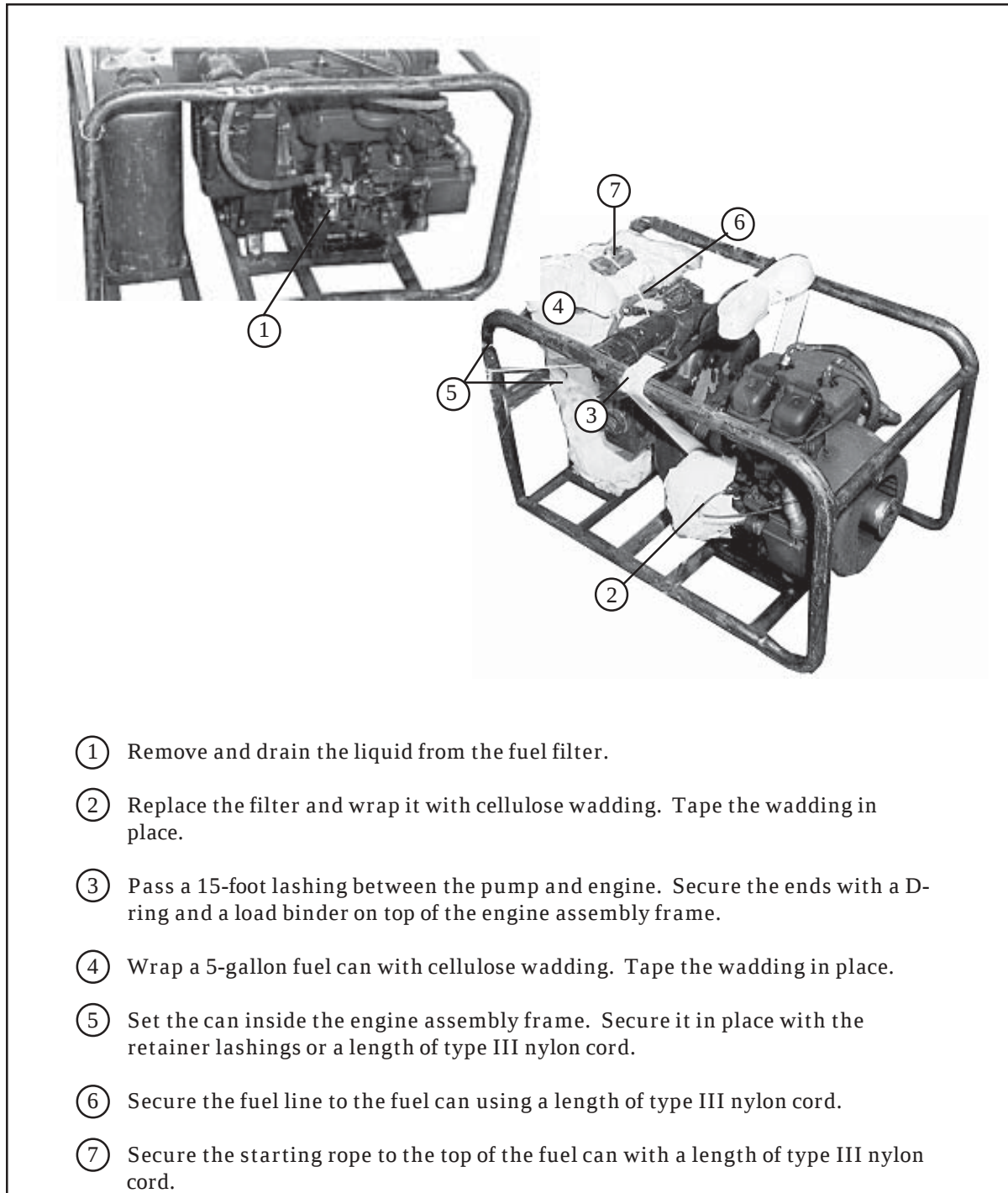


Figure 1-9. Pump/Engine Assembly Prepared

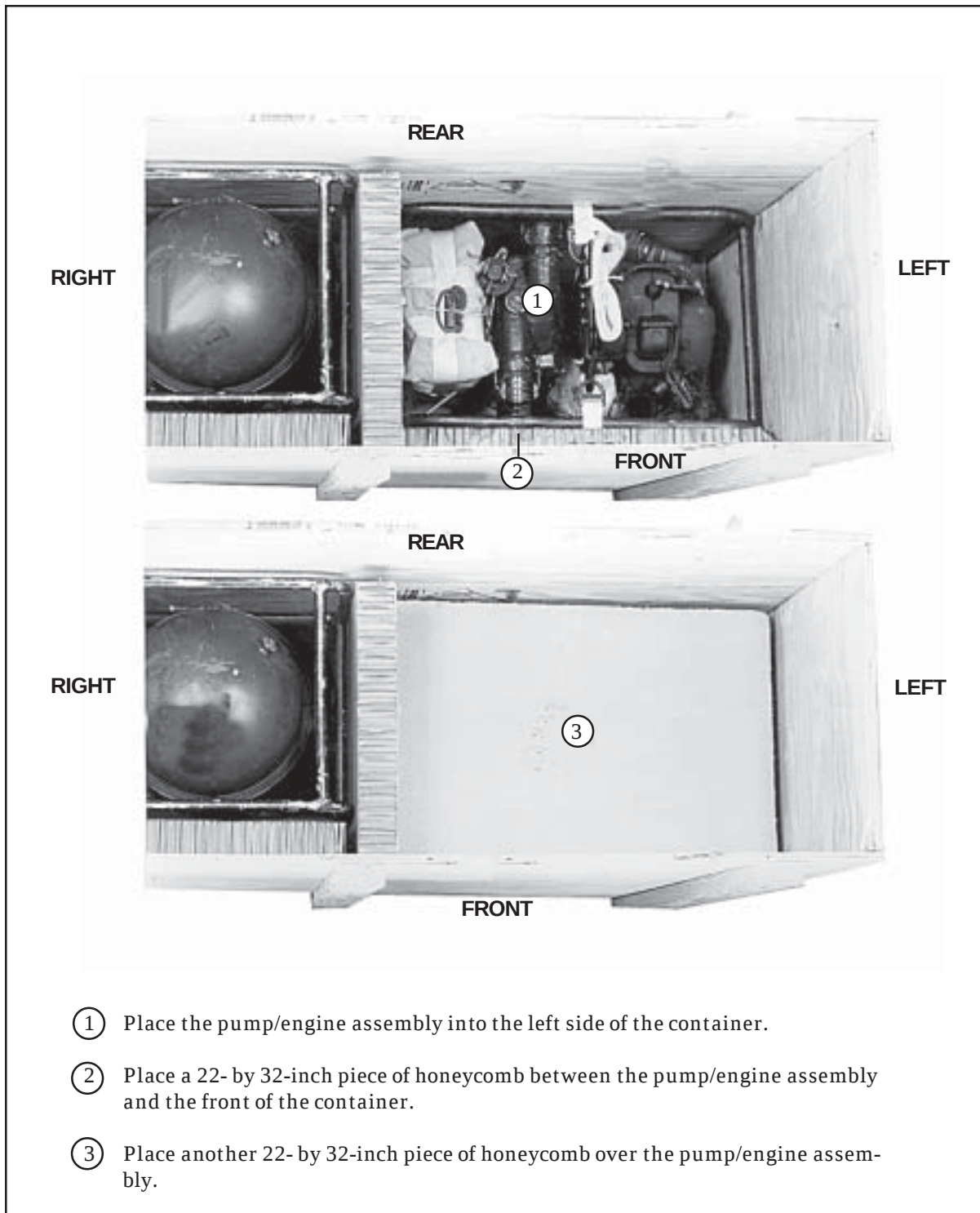


Figure 1-10. Pump/Engine Assembly Stowed

d. STOWING FIRE EXTINGUISHERS. Stow the fire extinguishers in the container as shown in Figure 1-11.

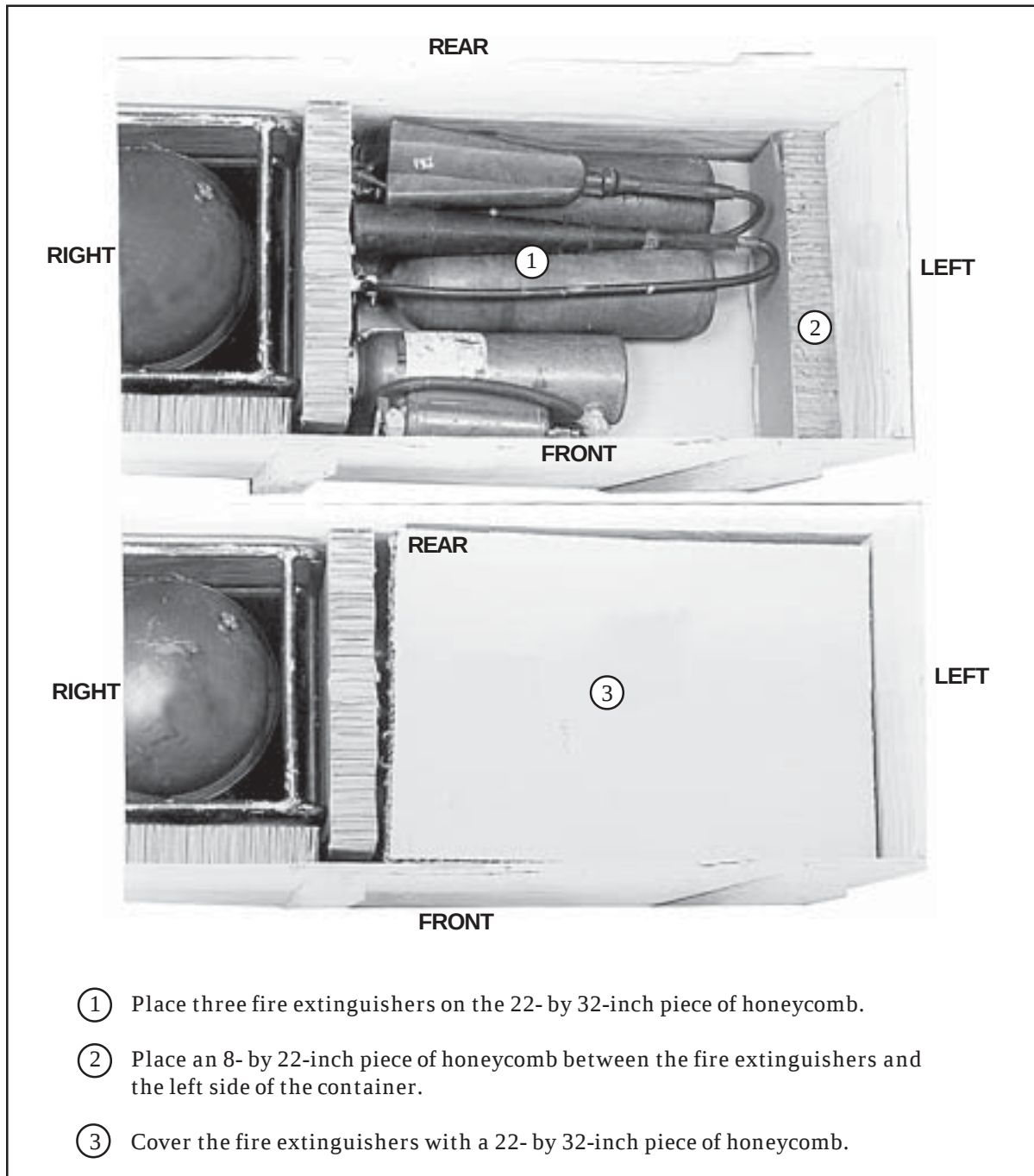
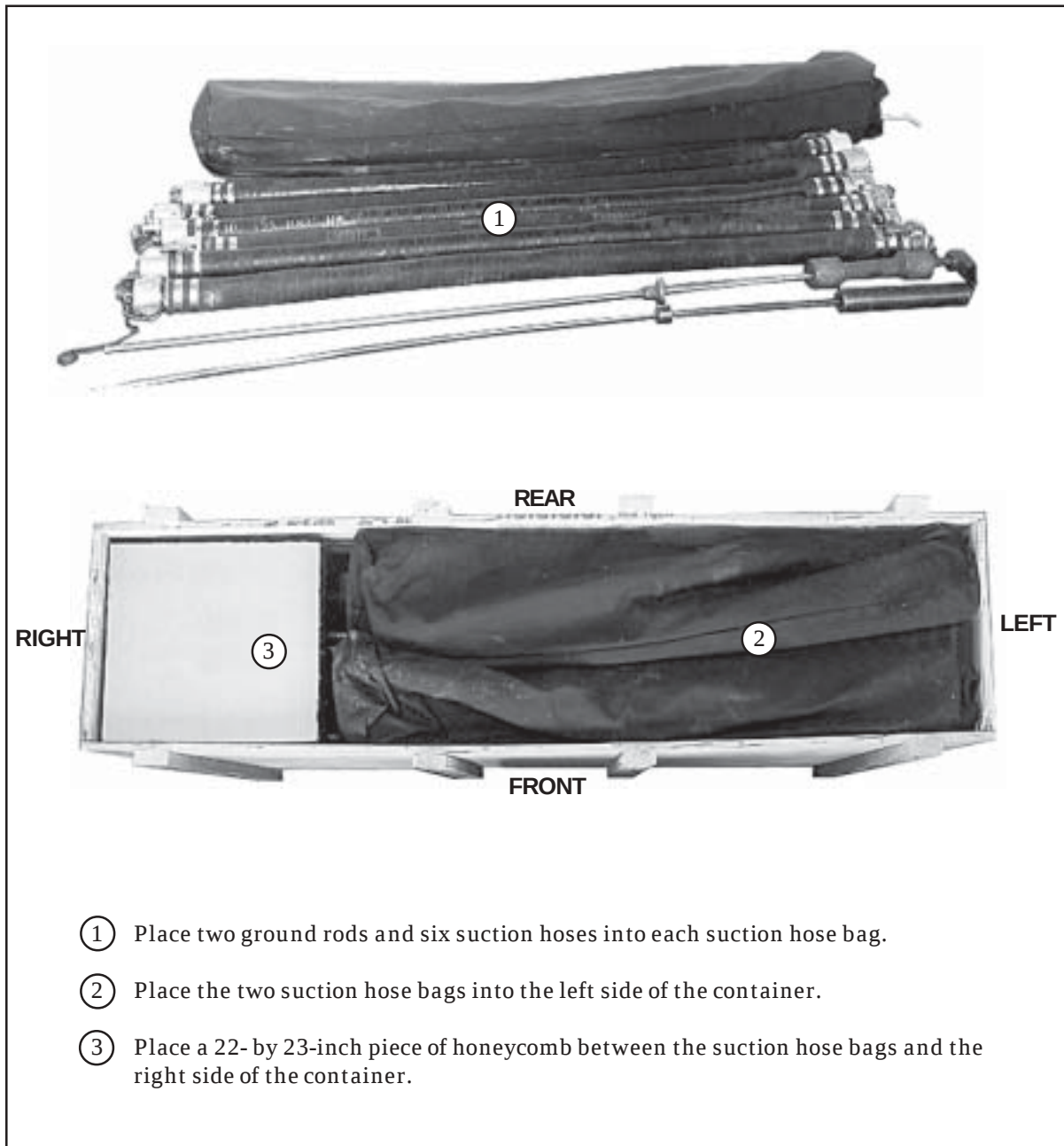


Figure 1-11. Fire Extinguishers Stowed

- e. **PREPARING AND STOWING GROUND RODS, SUCTION HOSES, AND SUCTION HOSE BAGS.** Prepare the ground rods, suction hoses, and suction hose bags for stowing. Stow the suction hose bags in the container as shown in Figure 1-12.



- ① Place two ground rods and six suction hoses into each suction hose bag.
- ② Place the two suction hose bags into the left side of the container.
- ③ Place a 22- by 23-inch piece of honeycomb between the suction hose bags and the right side of the container.

Figure 1-12. Ground Rods, Suction Hoses, and Bags Prepared and Stowed

SECURING CONTAINER

1-6. Use ten 15-foot tie-down assemblies to secure the container as shown in Figure 1-13.

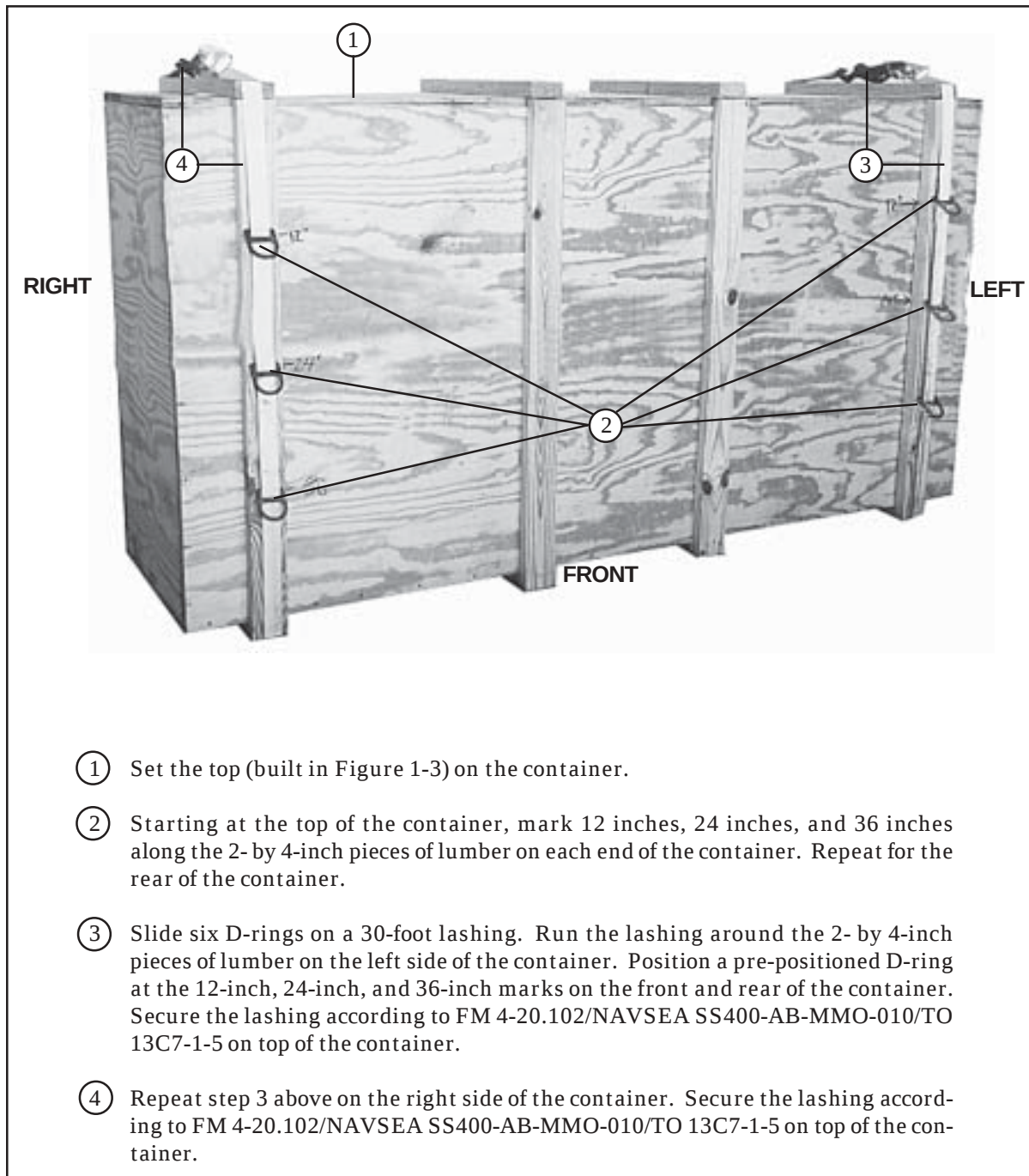


Figure 1-13. Container Secured

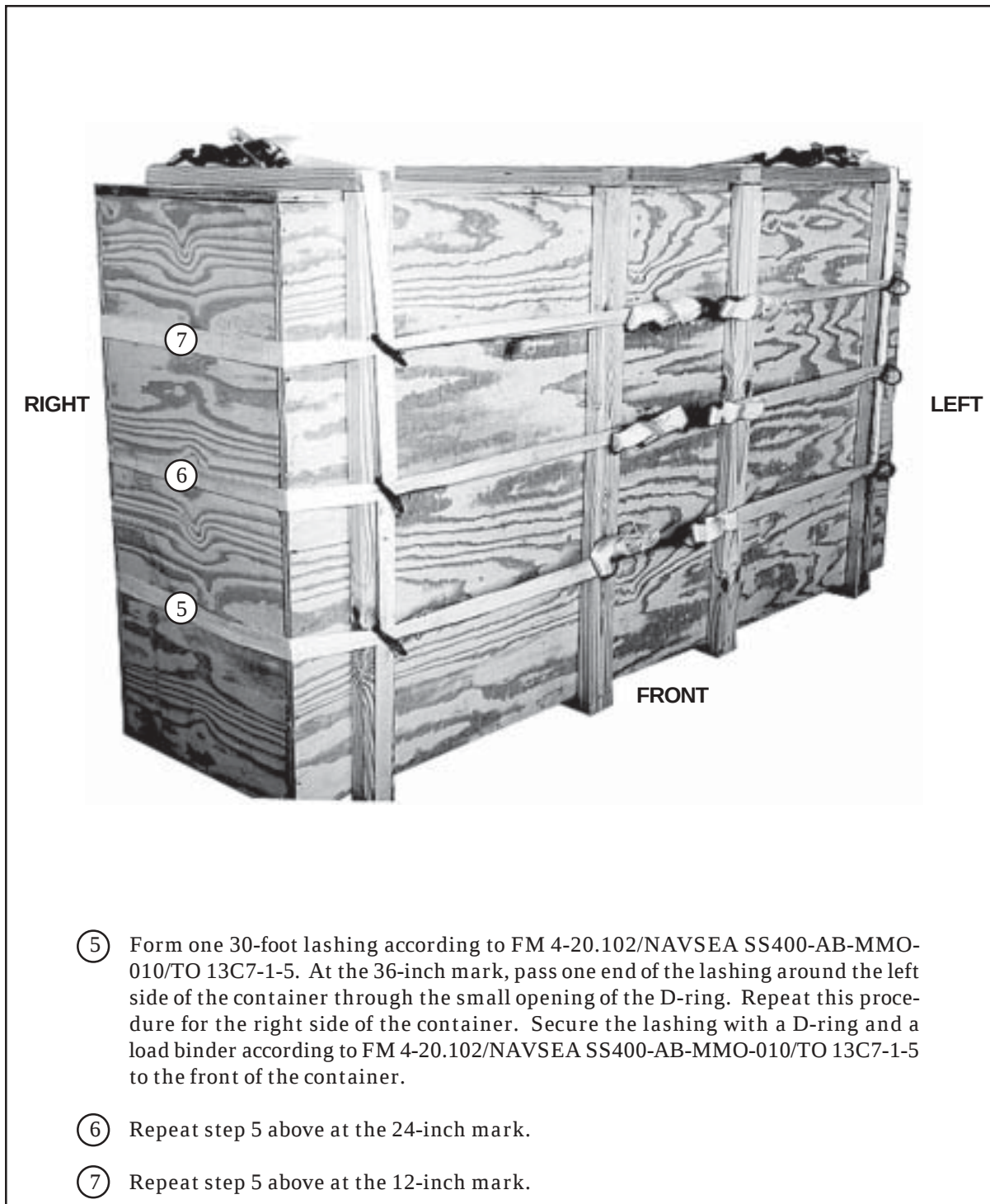


Figure 1-13. Container Secured (continued)

POSITIONING AND LASHING CONTAINER

1-7. Position the container and lash it to the platform as described below.

- a. **POSITIONING CONTAINER.** Position the container on the platform as shown in Figure 1-14.

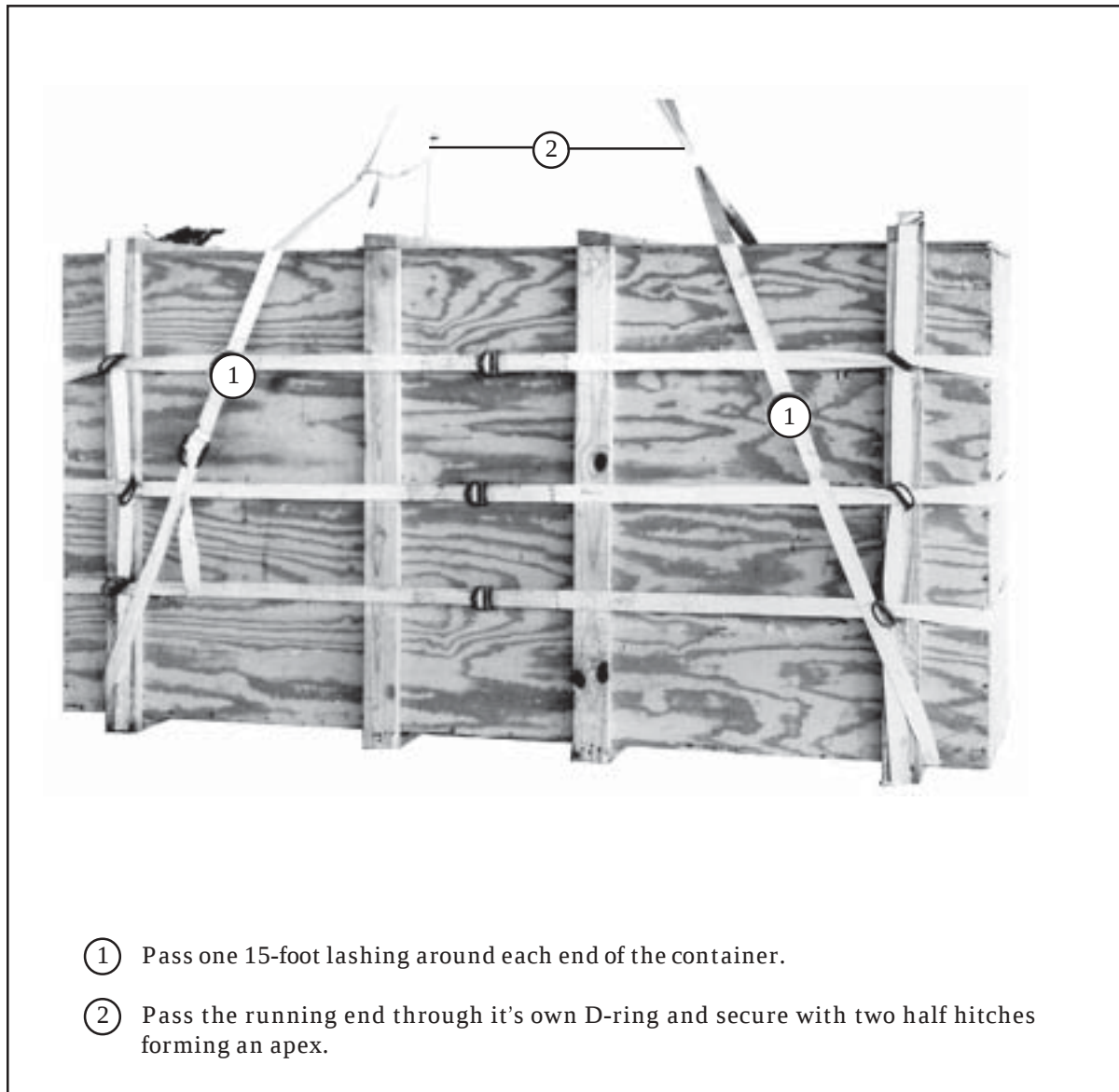
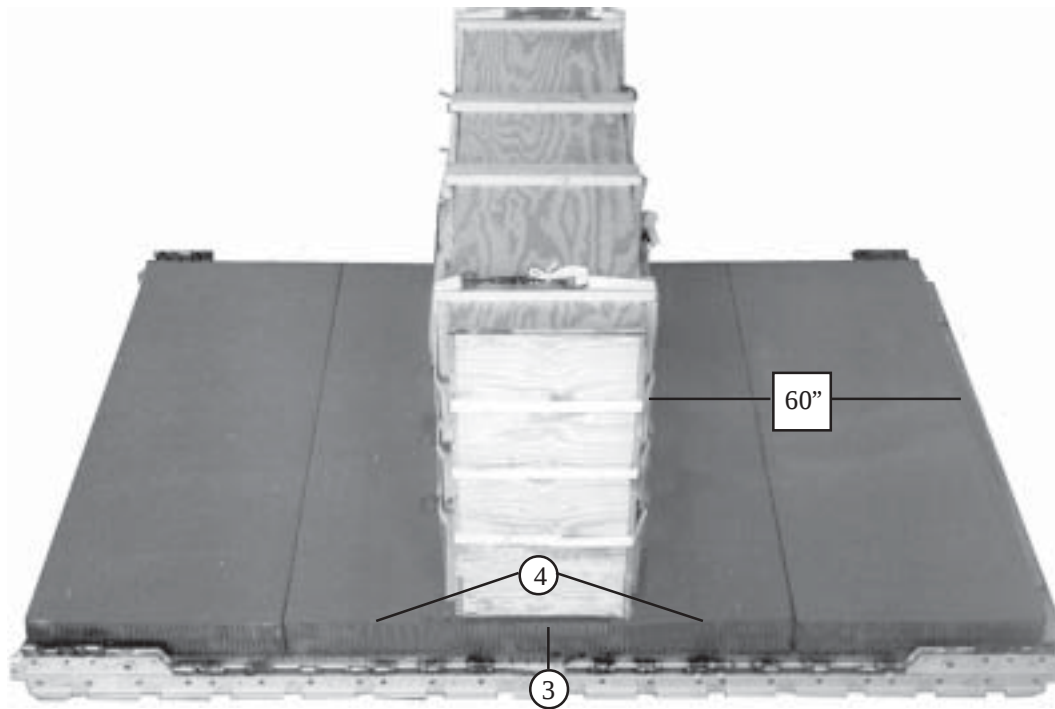


Figure 1-14. Container Positioned



- ③ Place an 11 1/4-inch mark on both sides on the bottom of the container.
- ④ Center the centering marks between honeycomb stacks 2 and 3.
- ⑤ Lift and center the container between honeycomb stacks 2 and 3 (not shown).
- ⑥ Make sure the front of the container is 60 inches from the front edge of honeycomb stack 1.

Figure 1-14. Container Positioned (continued)

- b. LASHING CONTAINER.** Use sixteen 15-foot tie-down assemblies to lash the container to the platform as outlined in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-15.

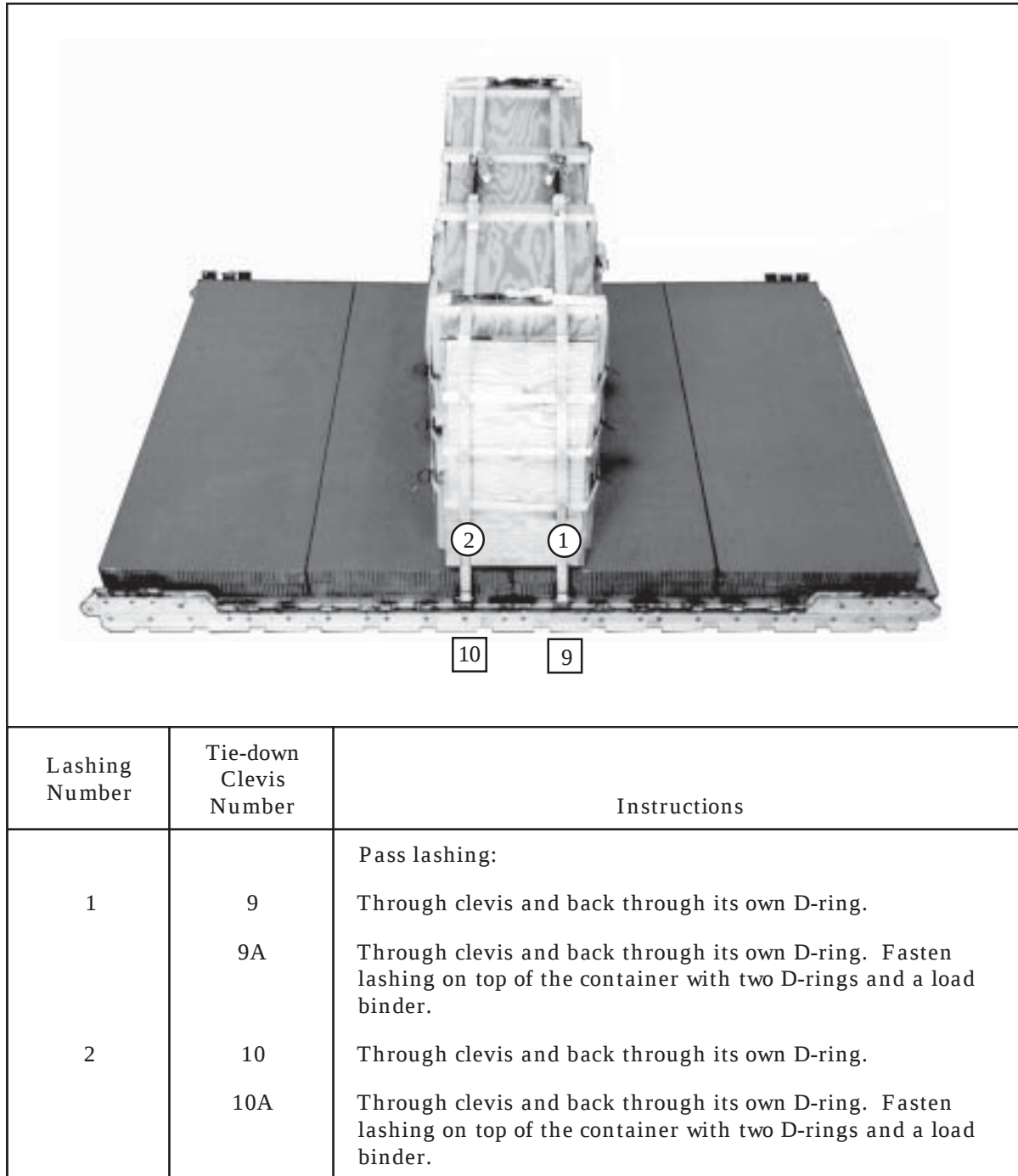


Figure 1-15. Container Lashed to Platform

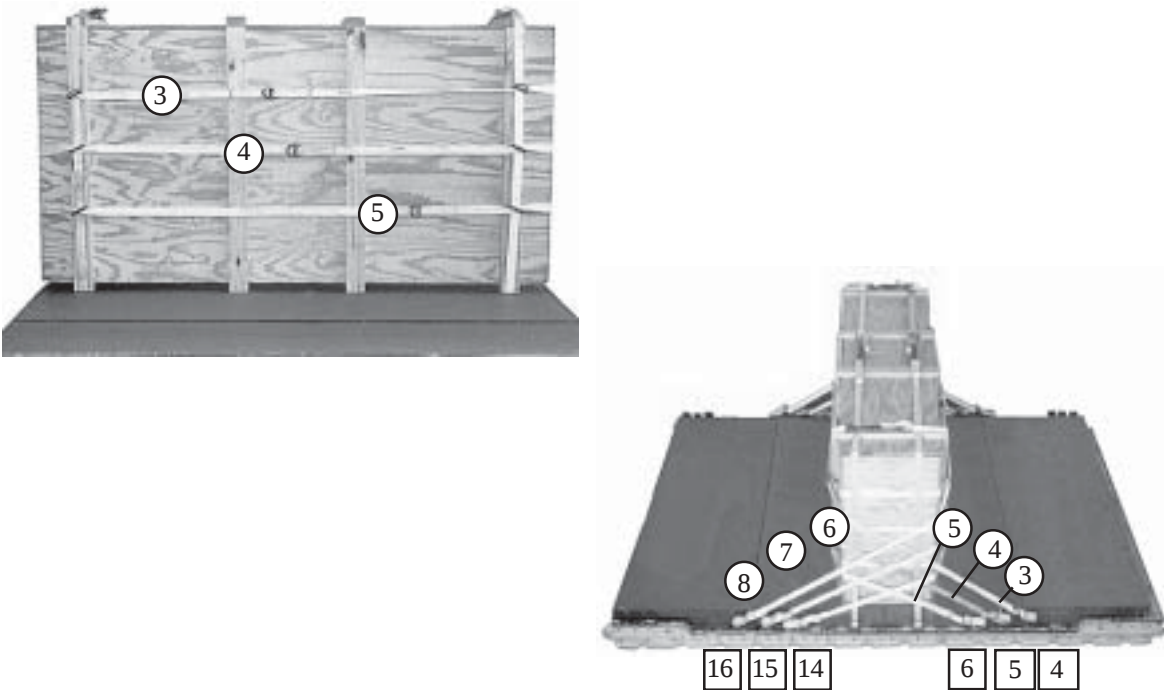
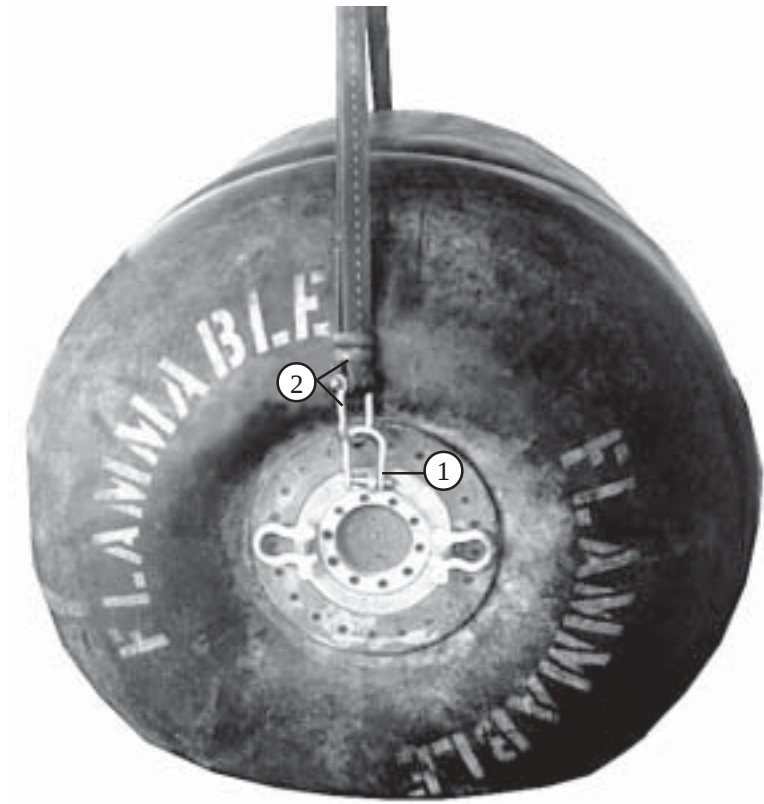
		
Lashing Number	Tie-down Clevis Number	Instructions
3	4 and 4A	Pass lashing: Around the rear of the container using the top row of D-rings.
4	5 and 5A	Around the rear of the container using the middle row of D-rings.
5	6 and 6A	Around the rear of the container using the bottom row of D-rings.
6	14 and 14A	Around the front of the container using the bottom row of D-rings.
7	15 and 15A	Around the front of the container using the middle row of D-rings.
8	16 and 16A	Around the front of the container using the top row of D-rings.

Figure 1-15. Container Lashed to Platform (continued)

ATTACHING LIFTING SLINGS

1-8. Attach the lifting slings to each fuel drum using four clevises and two 9-foot (2-loop), type XXVI nylon webbing slings as shown in Figure 1-16.



- ① Bolt a clevis to the center shackle of the swivel plate.
- ② Route a clevis through the center clevis bolted to the shackle. Bolt the clevis to a 9-foot sling.
- ③ Repeat steps 1 and 2 on the opposite side of the fuel drum and for the remaining fuel drum (not shown).

Figure 1-16. Lifting Slings Installed

PLACING AND LASHING FUEL DRUMS

1-9. Place and lash the fuel drums on the platform as described below.

- a. **FRONT FUEL DRUM.** Place the front fuel drum on the platform as shown in Figure 1-17. Lash the front fuel drum to the front of the platform as shown in Figure 1-18. Secure the ends of the lashings with a D-ring and a load binder according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

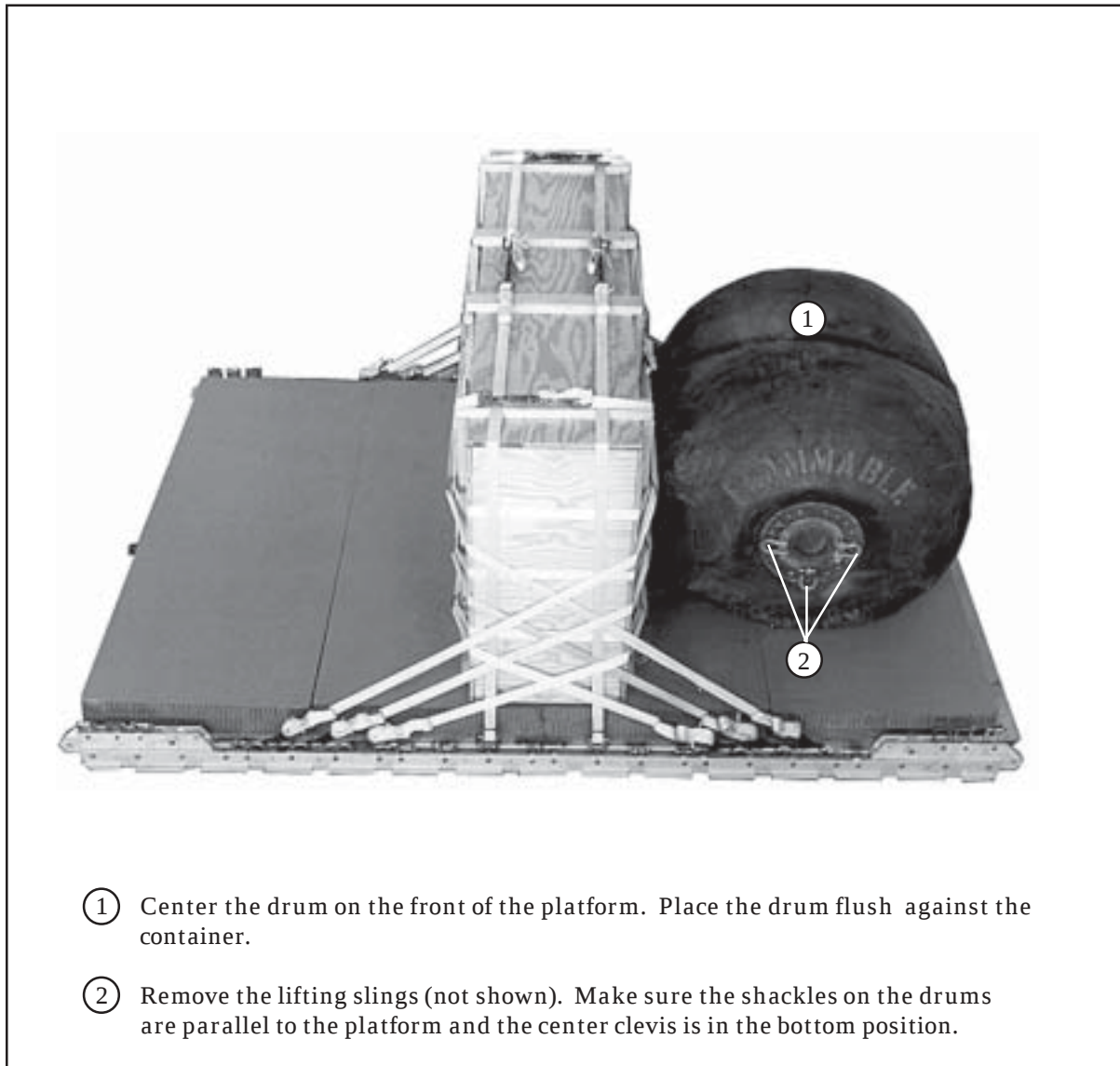
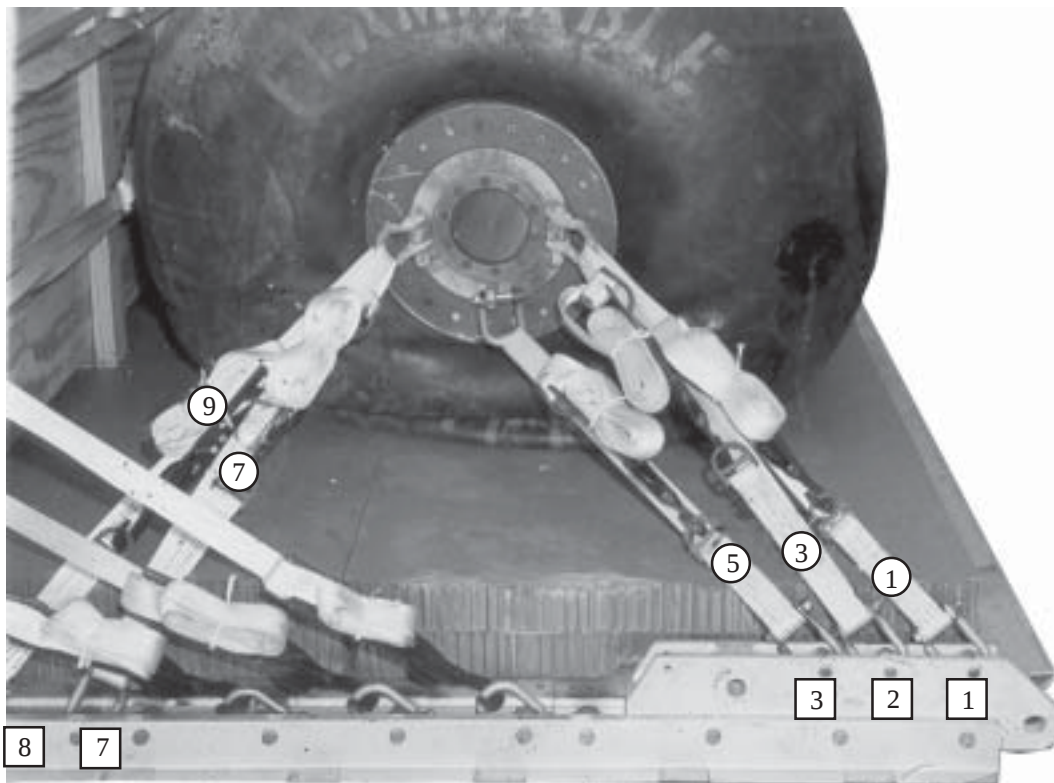


Figure 1-17. Front Fuel Drum Placed on Platform



Lashing Number	Tie-down Clevis Number	Instructions
1	1	Pass lashing:
2	1A	Through right front shackle.
3	2	Through left front shackle.
4	2A	Through right front shackle.
5	3	Through left front shackle.
6	3A	Through right center clevis.
7	7	Through left center clevis.
8	7A	Through right rear shackle.
9	8	Through left rear shackle.
10	8A	Through right rear shackle.

Figure 1-18. Front Drum Lashed to Platform

- b. REAR FUEL DRUM.** Place the rear fuel drum on the platform as shown in Figure 1-19. Lash the rear fuel drum to the rear of the platform as shown in Figure 1-20. Secure the ends of the lashings with a D-ring and a load binder according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

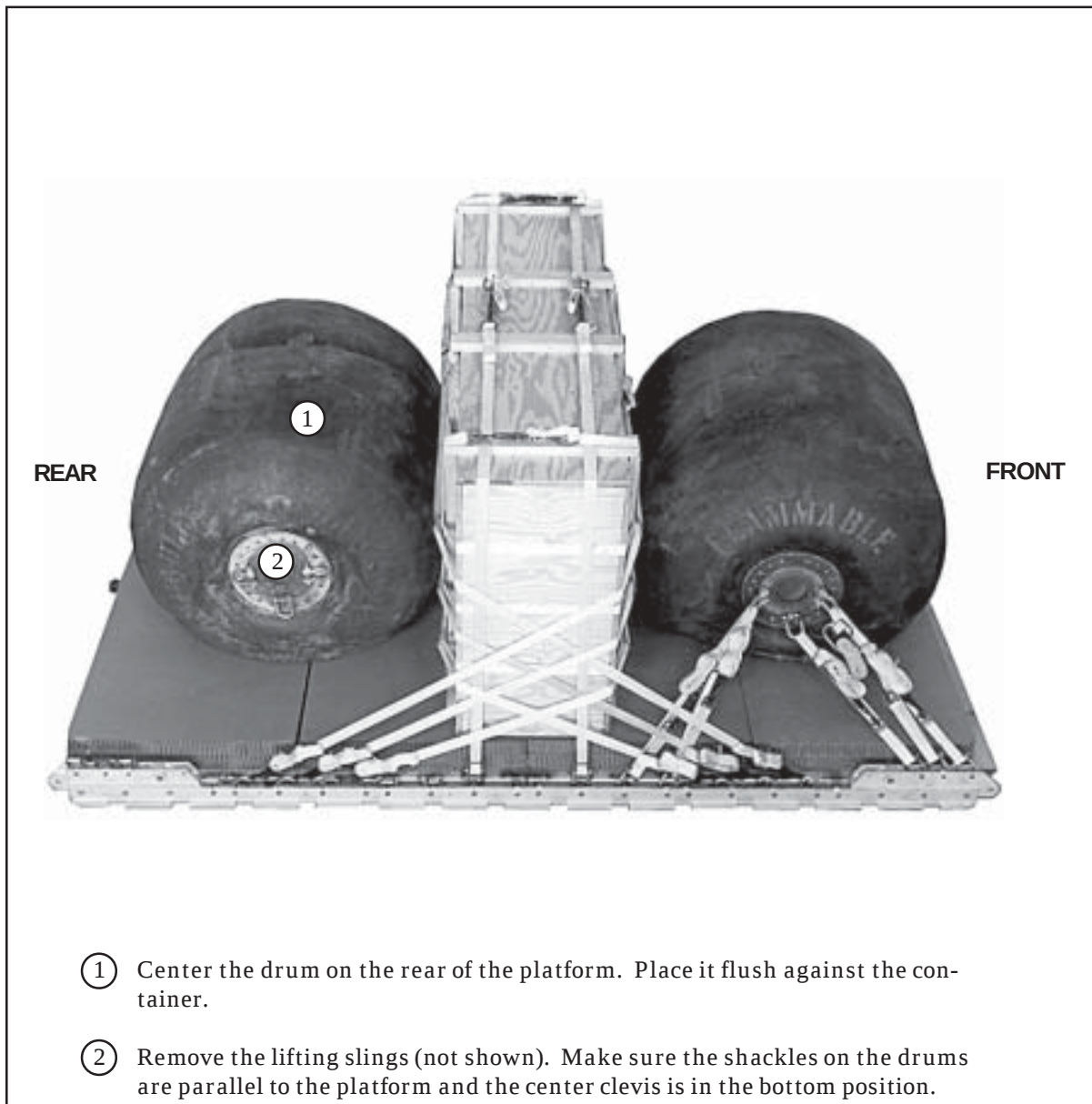


Figure 1-19. Rear Fuel Drum Placed on Platform

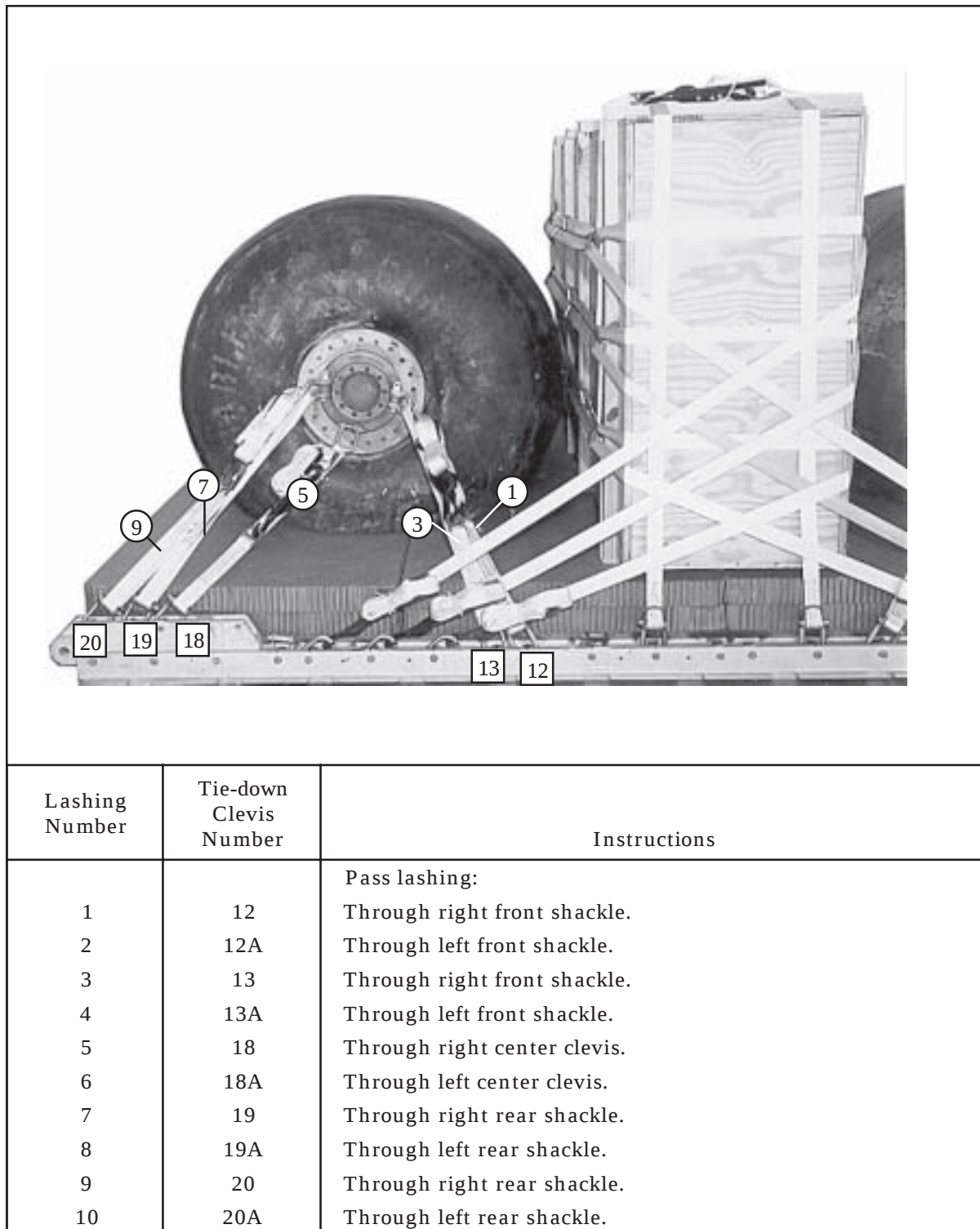
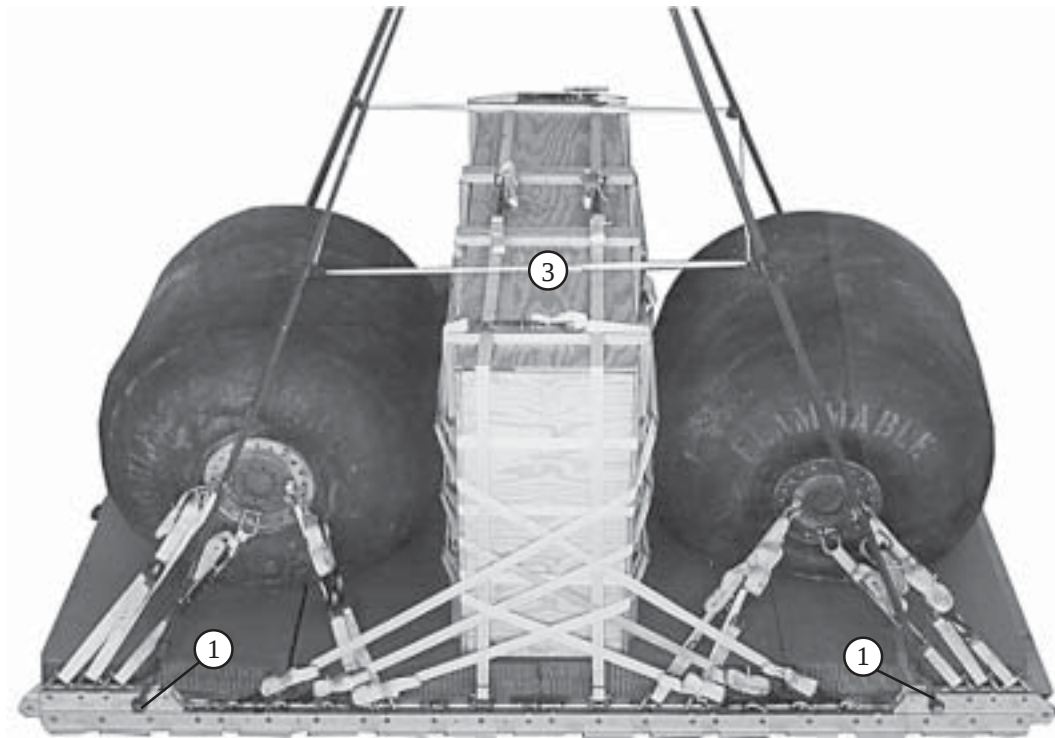


Figure 1-20. Rear Fuel Drum Lashed to Platform

INSTALLING SUSPENSION SLINGS

1-10. Install four large suspension clevises and four 12-foot (2-loop), type XXVI nylon webbing slings to the tandem links as shown in Figure 1-21.



- ① Bolt a 12-foot sling to each tandem link using a large suspension clevis.
- ② Raise the suspension slings to their full length using a lifting provision (not shown).
- ③ Safety the slings with a deadman's tie according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

Figure 1-21. Suspension Slings Installed

STOWING CARGO PARACHUTES

1-11. Prepare, place, and restrain two G-11 cargo parachutes according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-22.

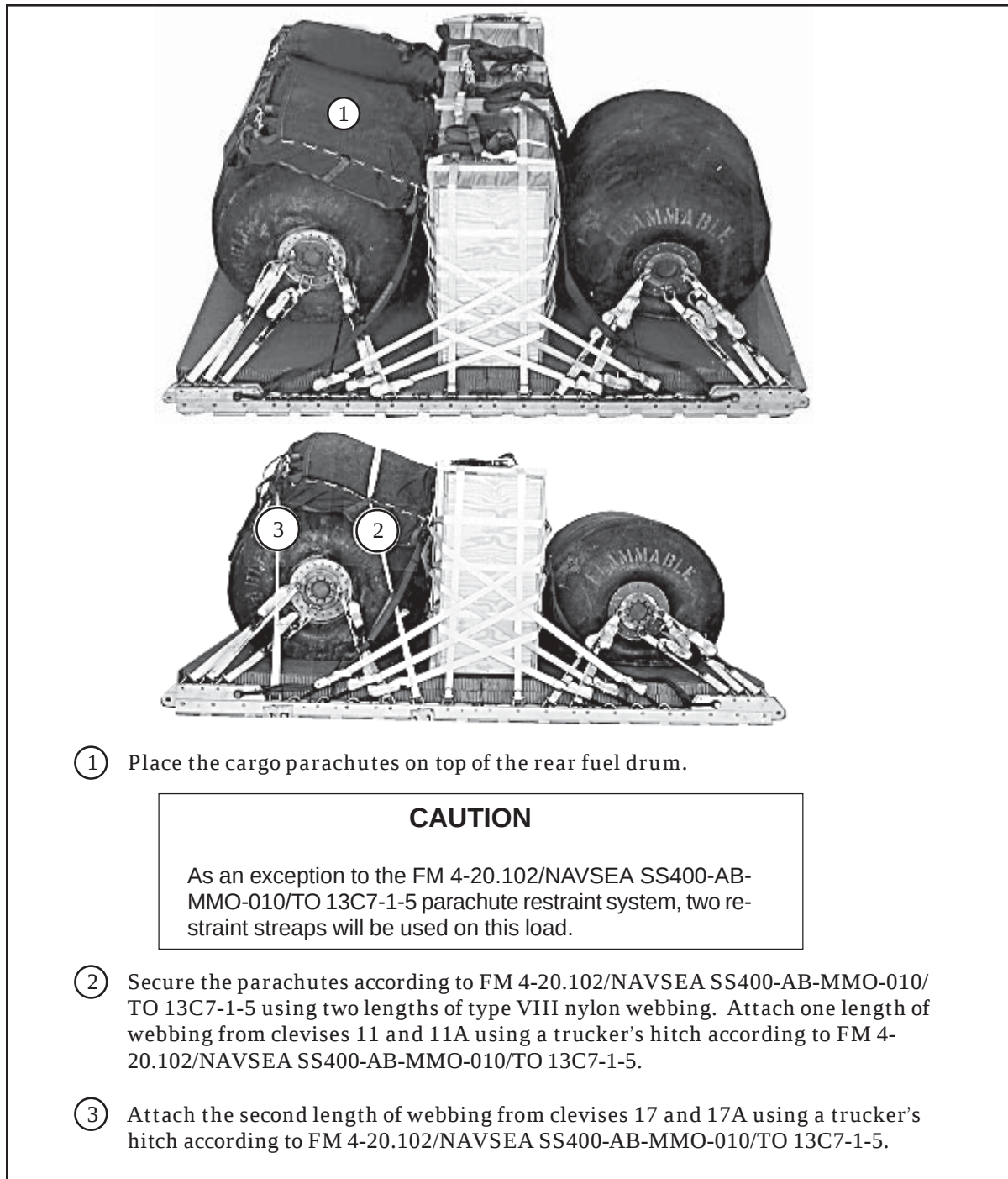
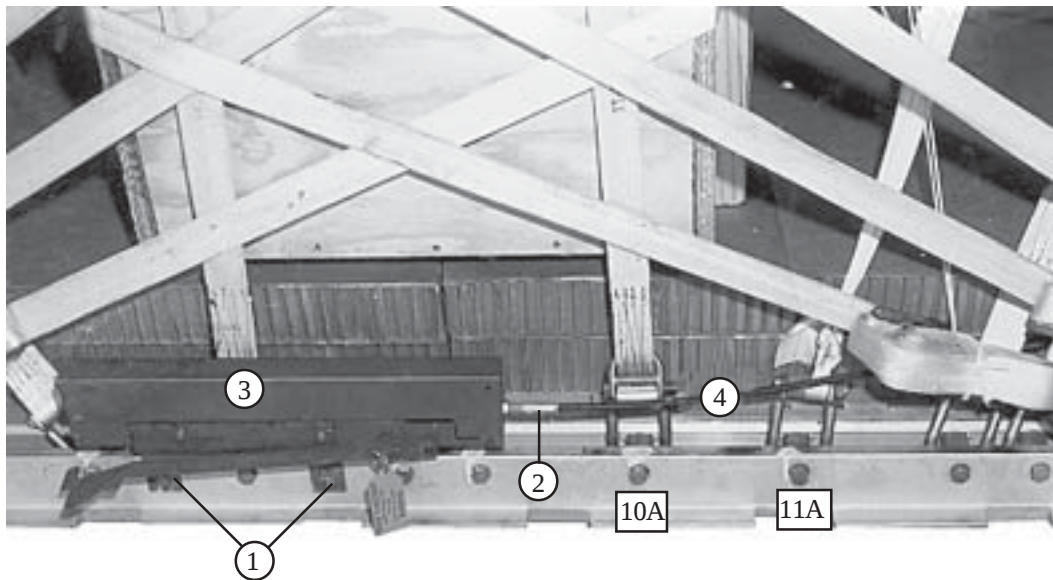


Figure 1-22. Cargo Parachutes Stowed

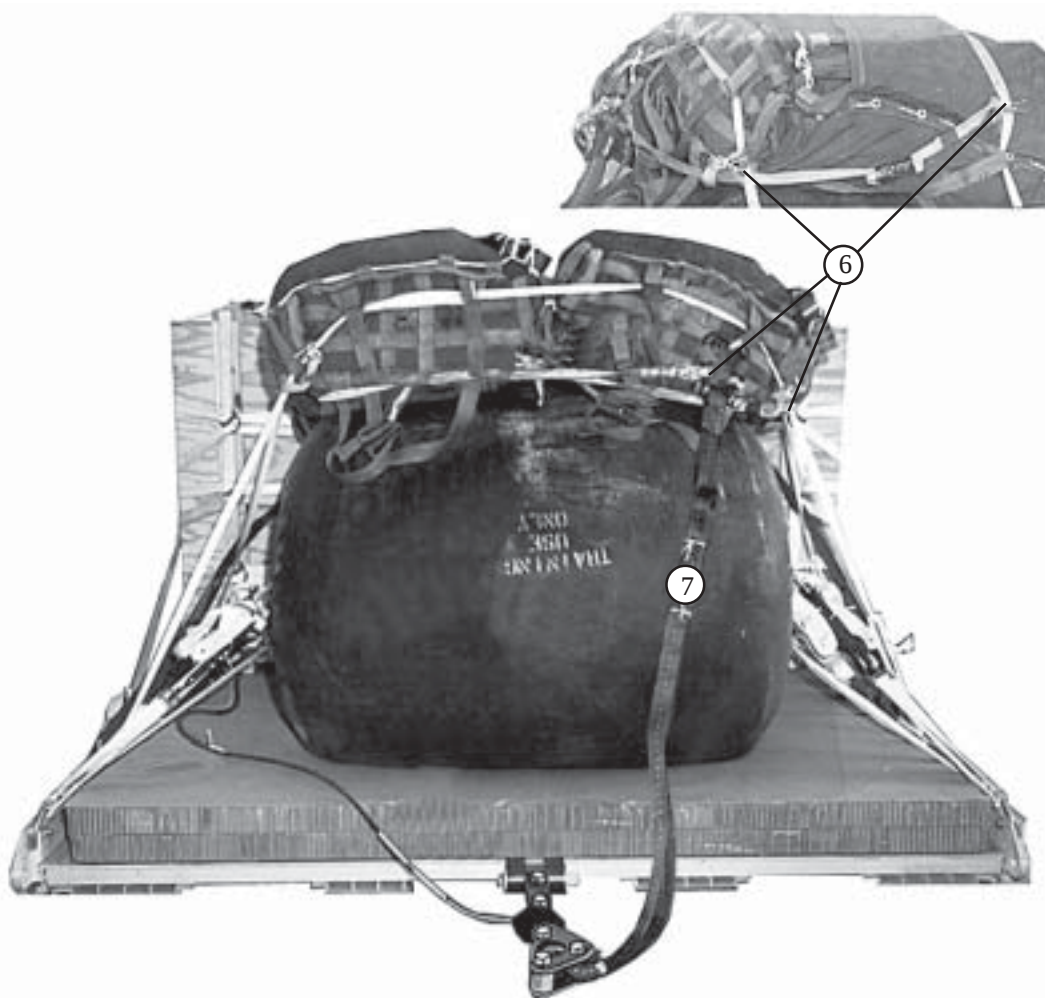
INSTALLING EXTRACTION SYSTEM

1-12. Install the Extraction Force Transfer Coupling (EFTC) extraction system according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-23.



- ① Install the actuator mounting brackets to the rear EFTC mounting holes on the left side rail.
- ② Install a 12-foot cable to the actuator assembly.
- ③ Attach the actuator assembly to the mounting brackets.
- ④ Route the cable from the actuator assembly between clevises 11A and 12A toward the rear of the platform.

Figure 1-23. Extraction System Installed



- ⑤ Safety the 12-foot cable to lashing 18A with a piece of type I, 1/4-inch cotton webbing (not shown).
- ⑥ Cluster the parachute bridles on a large clevis, and install the release knives according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
- ⑦ Use a 9-foot (2-loop), type XXVI nylon webbing sling for the deployment line.

Figure 1-23. Extraction System Installed (continued)

INSTALLING PARACHUTE RELEASE SYSTEM

1-13. Prepare and attach an M-1 cargo parachute release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-24.

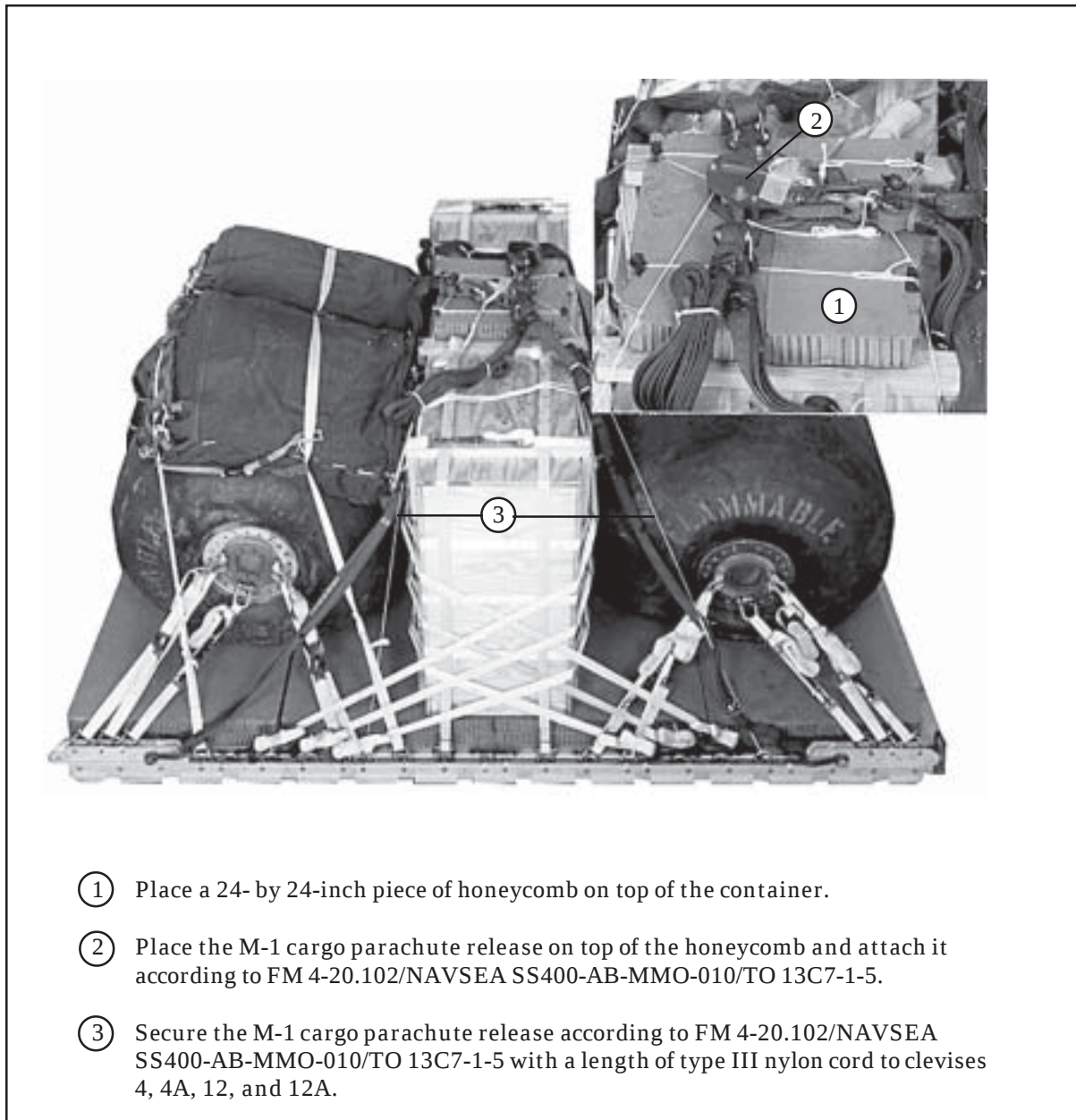


Figure 1-24. Parachute Release Attached

PLACING EXTRACTION PARACHUTE

1-14. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

1-15. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

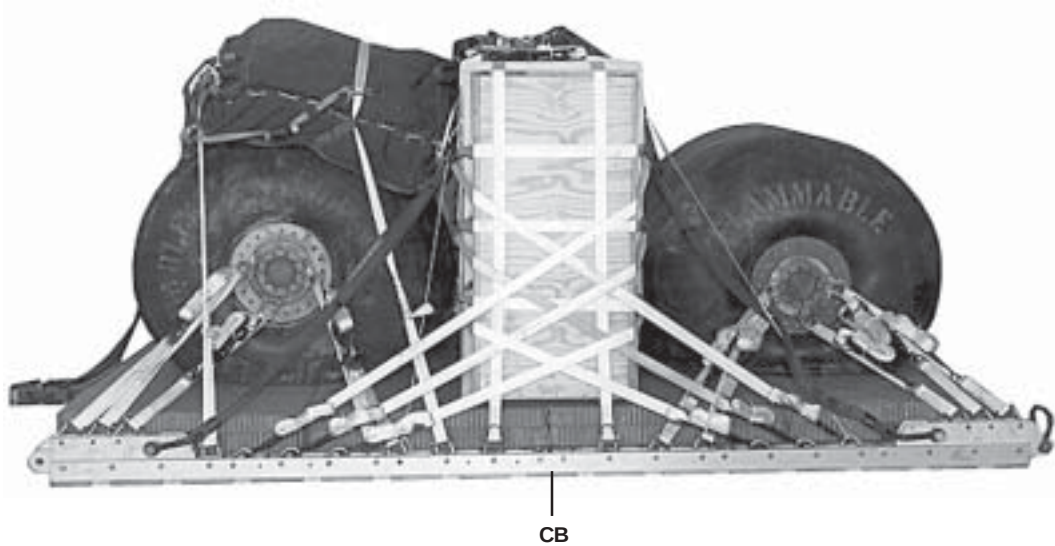
1-16. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-25. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

1-17. Use the equipment list in Table 1-2 to rig the load shown in Figure 1-25.

CAUTION:

Make the final inspection required by FM 4-20.102/
NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the
load leaves the rigging site.

**RIGGED LOAD DATA**

Weight	9,107 pounds
Maximum Weight	10,500 pounds
Height	70 inches
Width	108 inches
Overall Length	162 inches
Overhang: Front	0 inches
Rear (EFTC)	18 inches
Center of Balance (CB) (from front edge of platform)	72 inches
Extraction System	EFTC

Figure 1-25. FARE with Two 500-Gallon Fuel Drums Rigged for Low-Velocity Airdrop

Table 1-2 Equipment Required for Rigging FARE with Two 500-Gallon Fuel Drums for Low-Velocity Airdrop

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive, paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	5
4030-00-678-8562	Clevis, medium	4
8305-00-880-8155	Cloth coated, green, 60-inch	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5783	Coupling, airdrop, extraction force transfer with cable, 12-ft	1
1670-00-360-0328	Cover, Clevis, large	1
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
5365-00-937-0147	D-ring, heavy-duty, 10,000-lb	16
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, parachute bag (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add 2 for DES)	2
1670-01-064-4452	Line, drogue (for DES) 60-ft (1-loop), type XXVI	1
	Line, extraction:	1
1670-01-062-6313		1
1670-01-107-7651	For C-141: 140-ft (3-loop), type XXVI	
	For C-5:	1
1670-01-062-6313	60-ft, (3-loop), type XXVI and	1
1670-01-107-7651	140-ft (3-loop), type XXVI	
	For C-17:	1
1670-01-107-7651	140-ft (3-loop), type XXVI	
	Link Assembly: (double the quantity for DES)	
	Two-point:	1
5306-00-435-8994	Bolt, 1-in diam, 4-in long	(2)
5310-00-232-5165	Nut, 1-in, hexagonal	(2)
1670-00-003-1953	Plate, side, 3 3/4-in	(2)
5365-00-007-3414	Spacer, large	(2)
N/A	Link, tow release mechanized (H-Block) C-17 aircraft	1

Table 1-2 Equipment Required for Rigging FARE with Two 500-Gallon Fuel Drums for Low-Velocity Airdrop (continued)

National Stock Number	Item	Quantity
5510-00-220-6146	Lumber, 2- by 4-in: 24-inch 27-inch 50 1/4-inch	4 4 8
5315-00-010-4659	Nail, steel wire, 8d	As required
1670-00-753-3928	Pad, energy-dissipating (honeycomb) 3- by 36- by 96-in	11 sheets
1670-01-016-7841	Parachute: Cargo: G-11B Cargo extraction: 22-ft Drogue (for DES) 15-ft	2 1 1
1670-01-353-8425	Platform, airdrop, type V, 12-ft: Bracket assembly, coupling	(1)
1670-01-162-2372	Clevis assembly, type V	(48)
1670-01-162-2376	Extraction bracket assembly	(1)
1670-01-162-2381	Tandem link assembly (Multipurpose link)	(4)
5530-00-128-4981	Plywood, 3/4-in	3 sheets
1670-01-097-8816	Release, cargo parachute, M-1	1
1670-01-062-6303	Sling, cargo, airdrop For suspension: 12-ft (2-loop), type XXVI nylon webbing For lifting: 12-ft (2-loop), type XXVI nylon webbing For deployment: 9-ft (2-loop), type XXVI nylon webbing For riser extension: 20-ft (2-loop), type XXVI nylon webbing	4 2 1 2
5340-00-040-8219	Strap, parachute release, multi-cut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	55
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Type VIII	As required

SECTION II - RIGGING FARE IN AN M101 SERIES , 3/4-TON TRAILER

DESCRIPTION OF LOAD

1-18. The FARE, weighing 860 pounds, is stowed as an accompanying load in the M101 or M101A1, 3/4-ton trailer. This load is rigged for low-velocity airdrop on a 12-foot, type V platform. One G-11 cargo parachute is used for this load. The height of the trailer is 83 inches, reducible to 51-inches. It is 71 inches wide and 147 inches long. The trailer may have an additional 640 pounds stowed in it.

PREPARING PLATFORM

1-19. Prepare a 12-foot type V airdrop platform using four tandem links and 18 tie-down clevises as shown in Figure 1-26.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

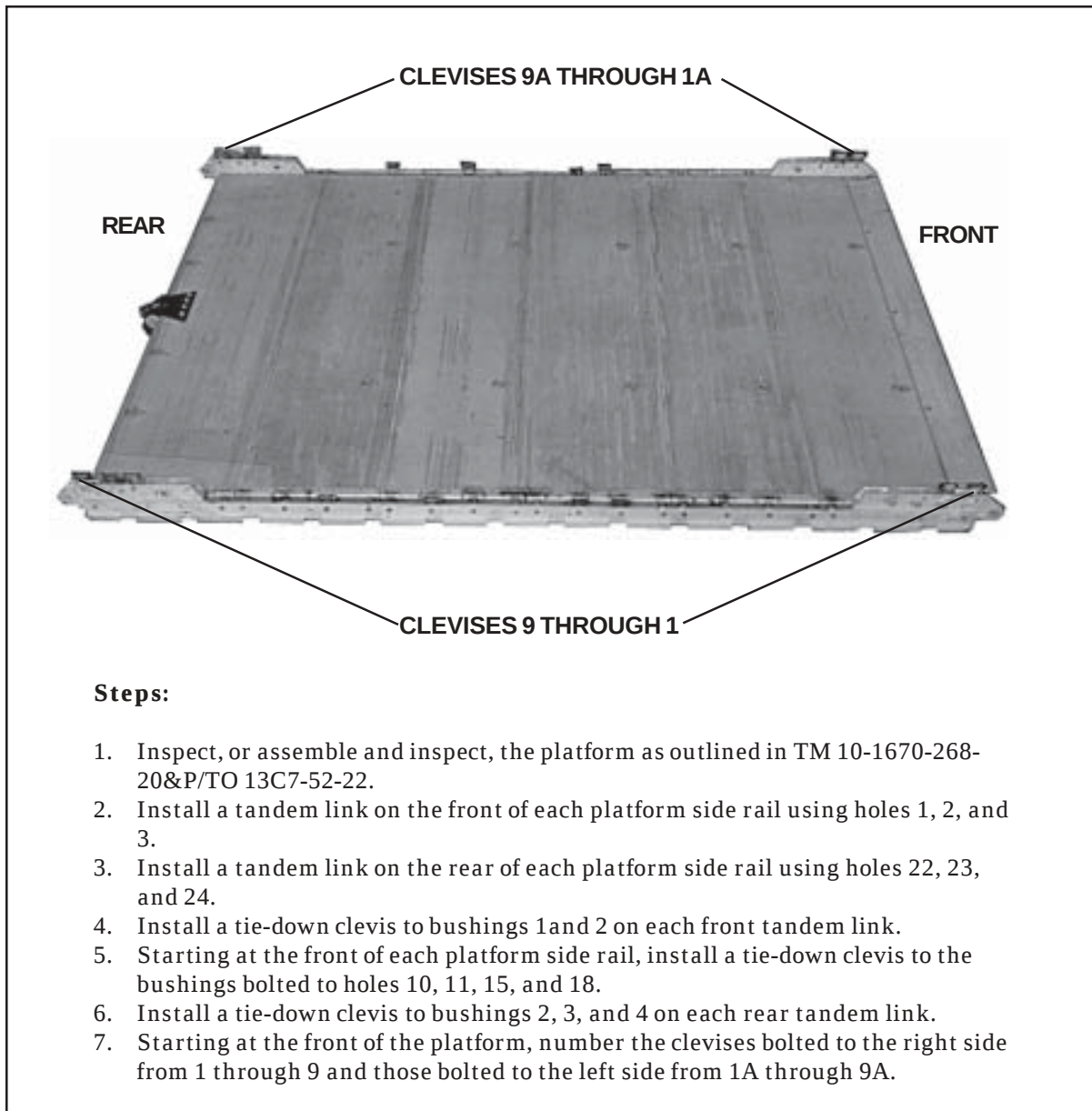
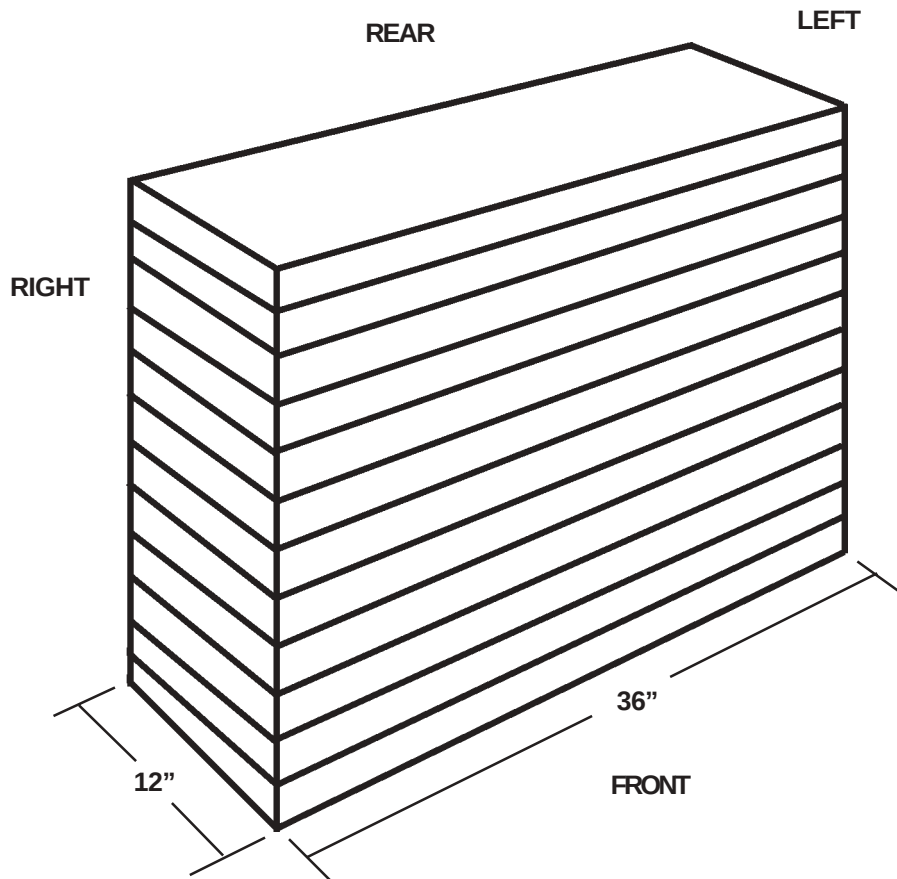


Figure 1-26. Platform Prepared

BUILDING AND PLACING HONEYCOMB STACKS

1-20. Build three honeycomb stacks using the material listed and shown in Figures 1-27, 1-28, and 1-29. Place the stacks on the platform as shown in Figures 1-30 and 1-31.

Note: This drawing is not drawn to scale.



Stack Number	Pieces	Width (Inches)	Length (Inches)	Material	Instructions
1	12	36	12	Honeycomb	Place and glue pieces together to form a stack.

Figure 1-27. Stack 1 Prepared

Note: This drawing is not drawn to scale.

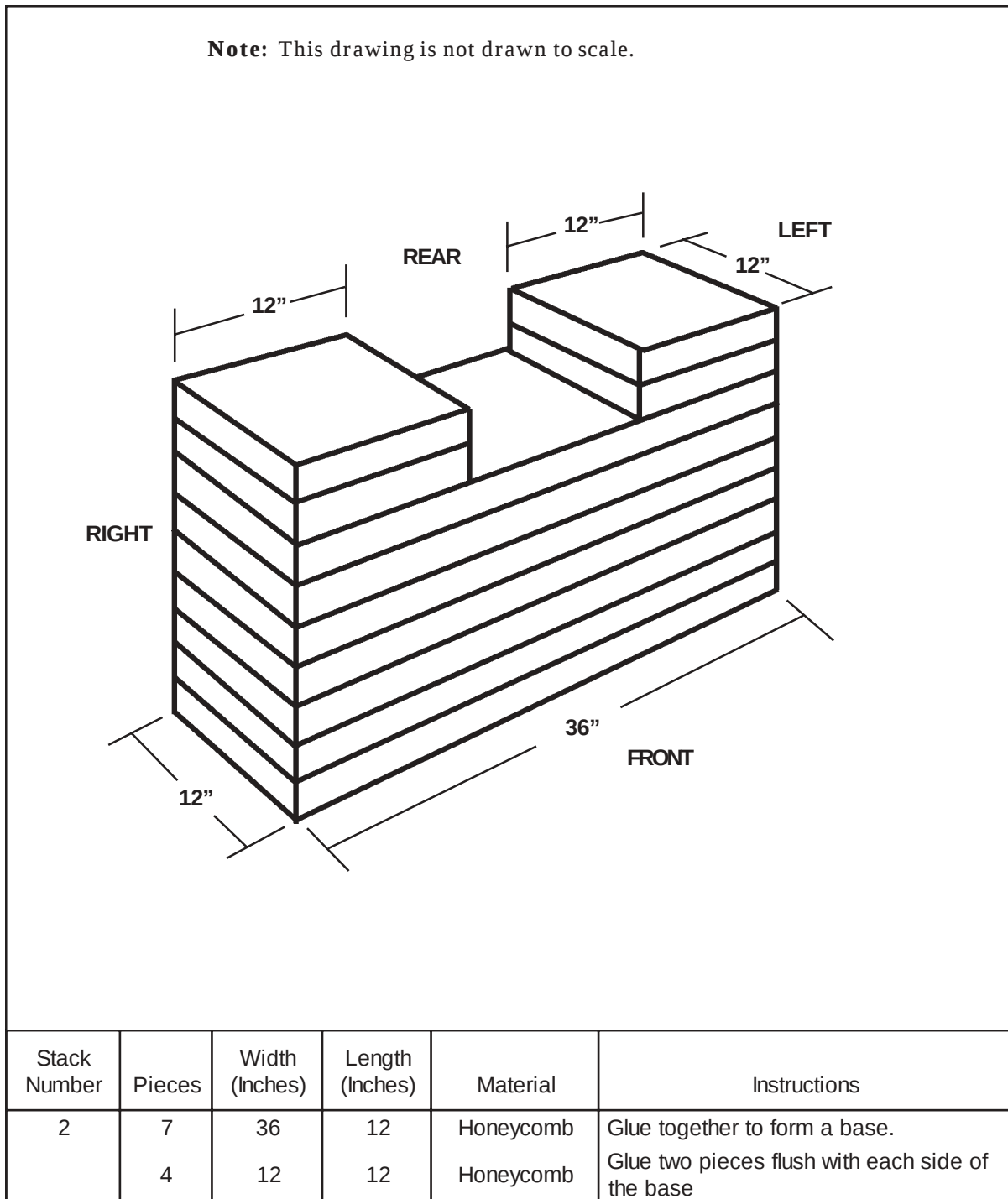


Figure 1-28. Stack 2 Prepared

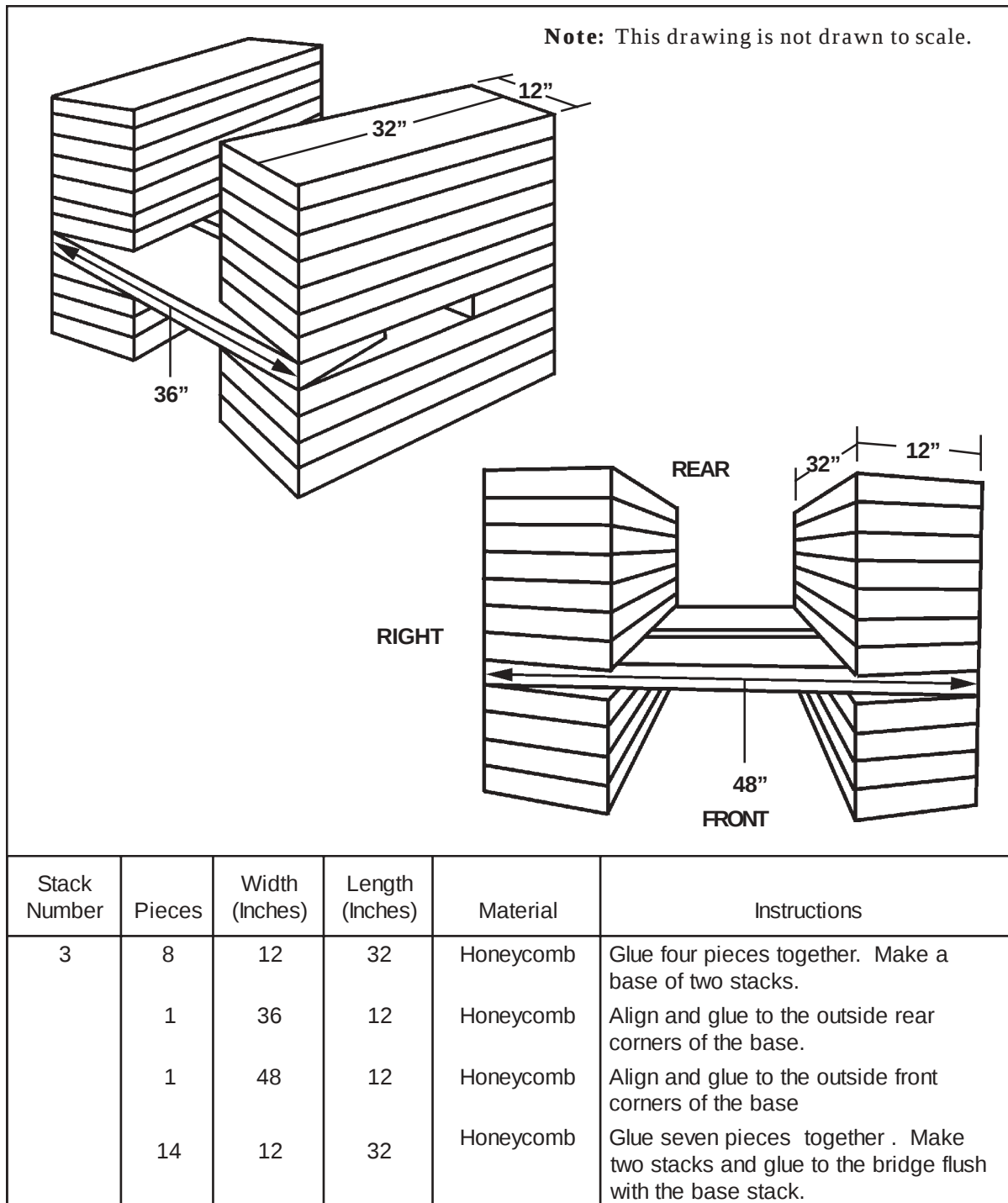


Figure 1-29. Stack 3 Prepared

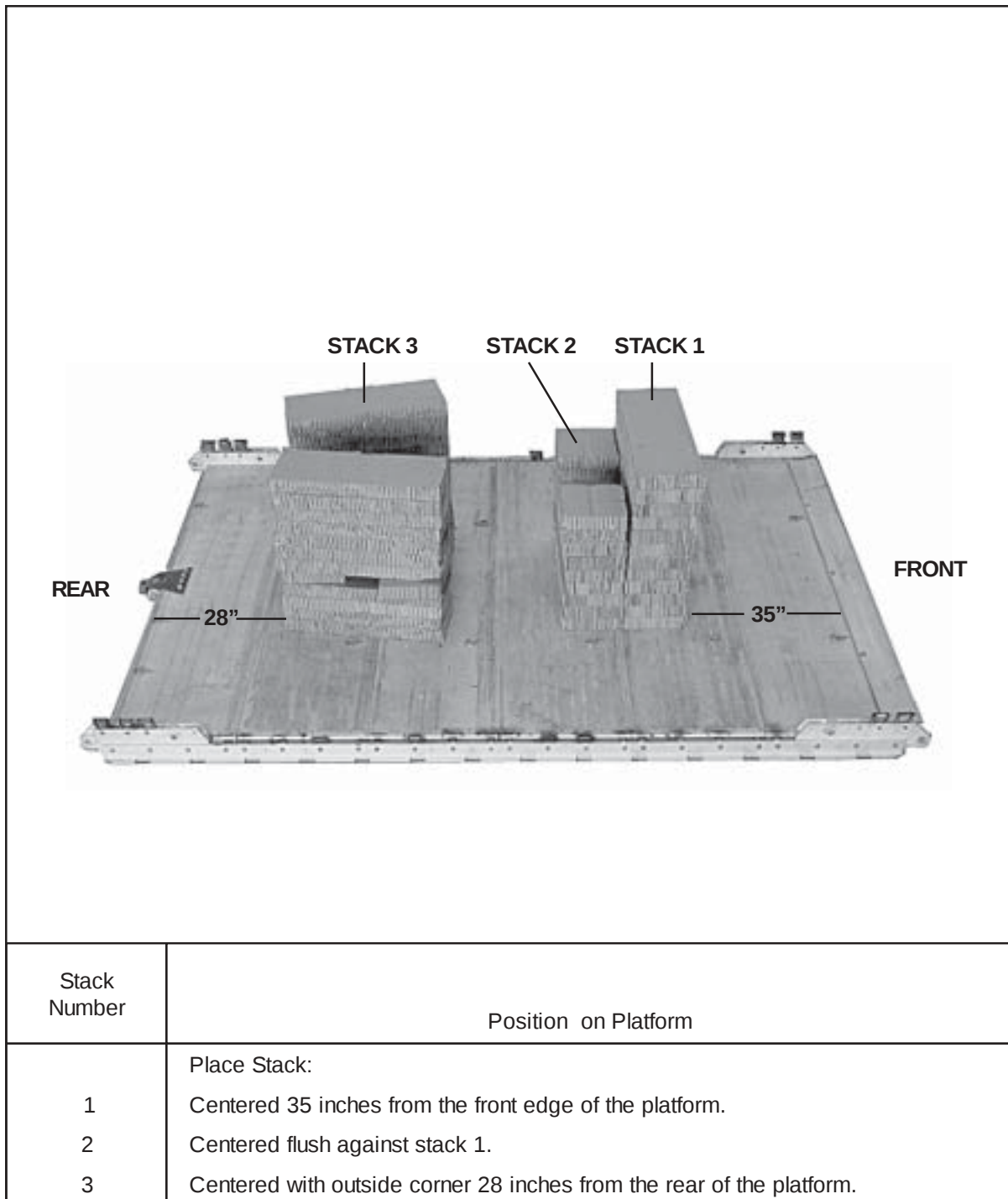


Figure 1-30. Honeycomb Stacks Placed on Platform

Note: This drawing is not drawn to scale.

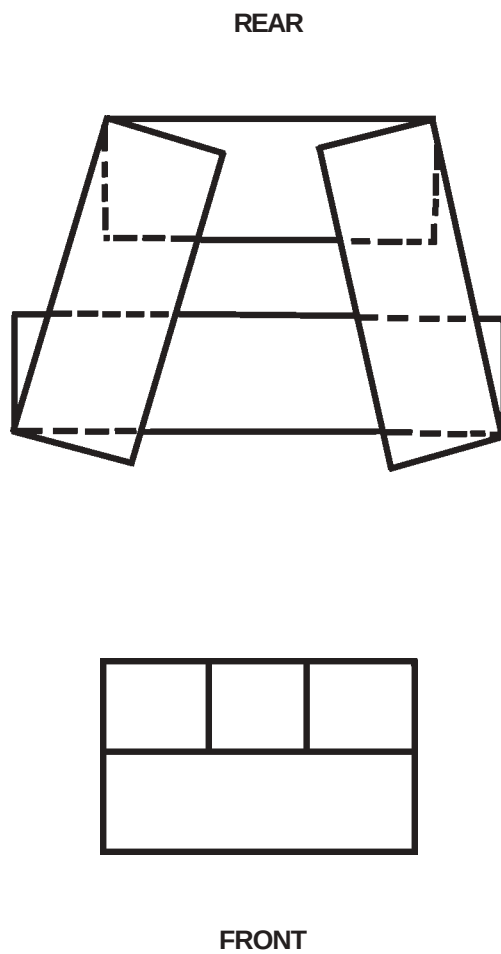


Figure 1-31. Top View of Honeycomb Stacks Placed on Platform

PREPARING TRAILER

1-21. Prepare the trailer as described below.

- a. **REMOVING COMPONENTS.** Remove the components from the trailer as shown in Figure 1-32.

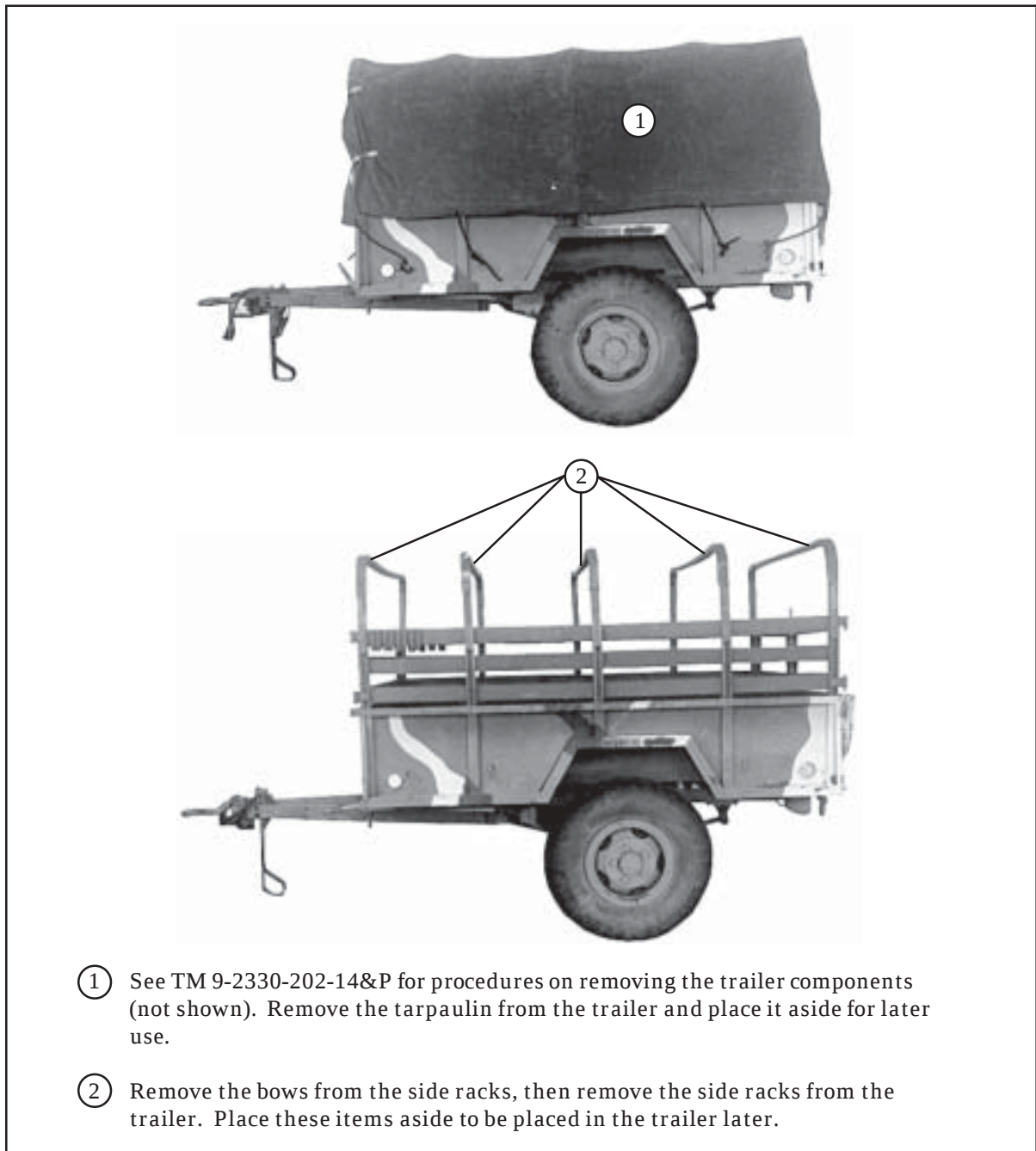
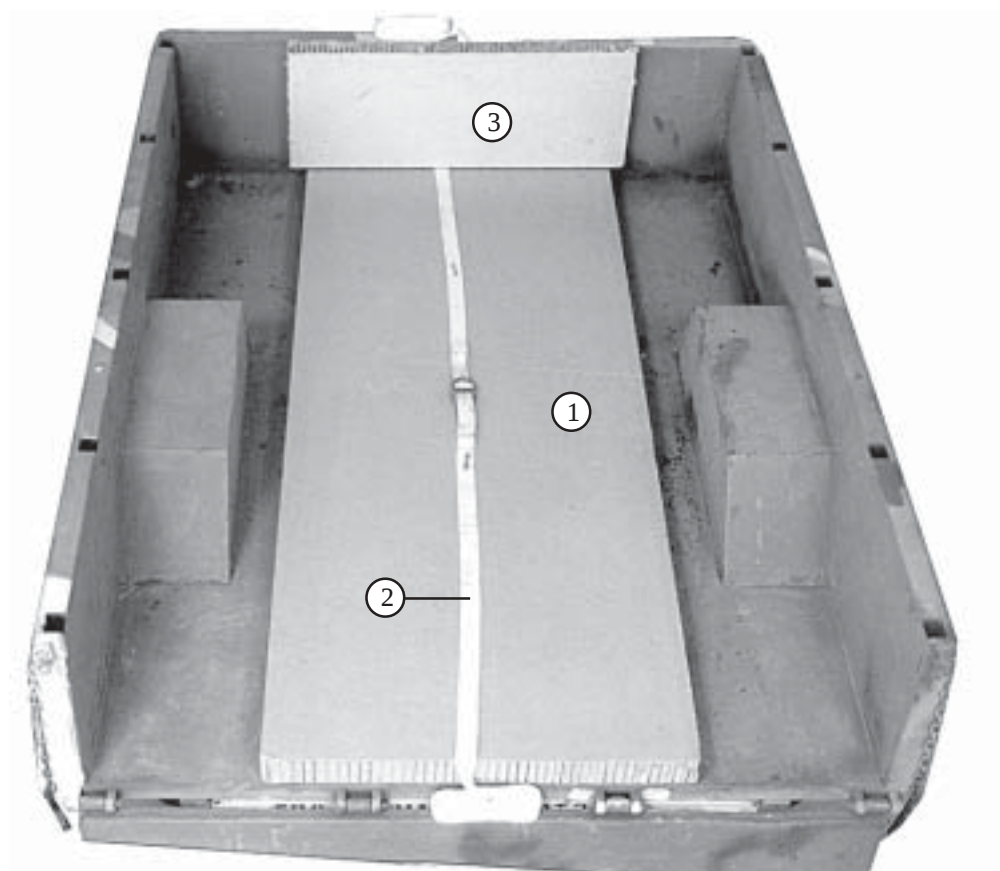


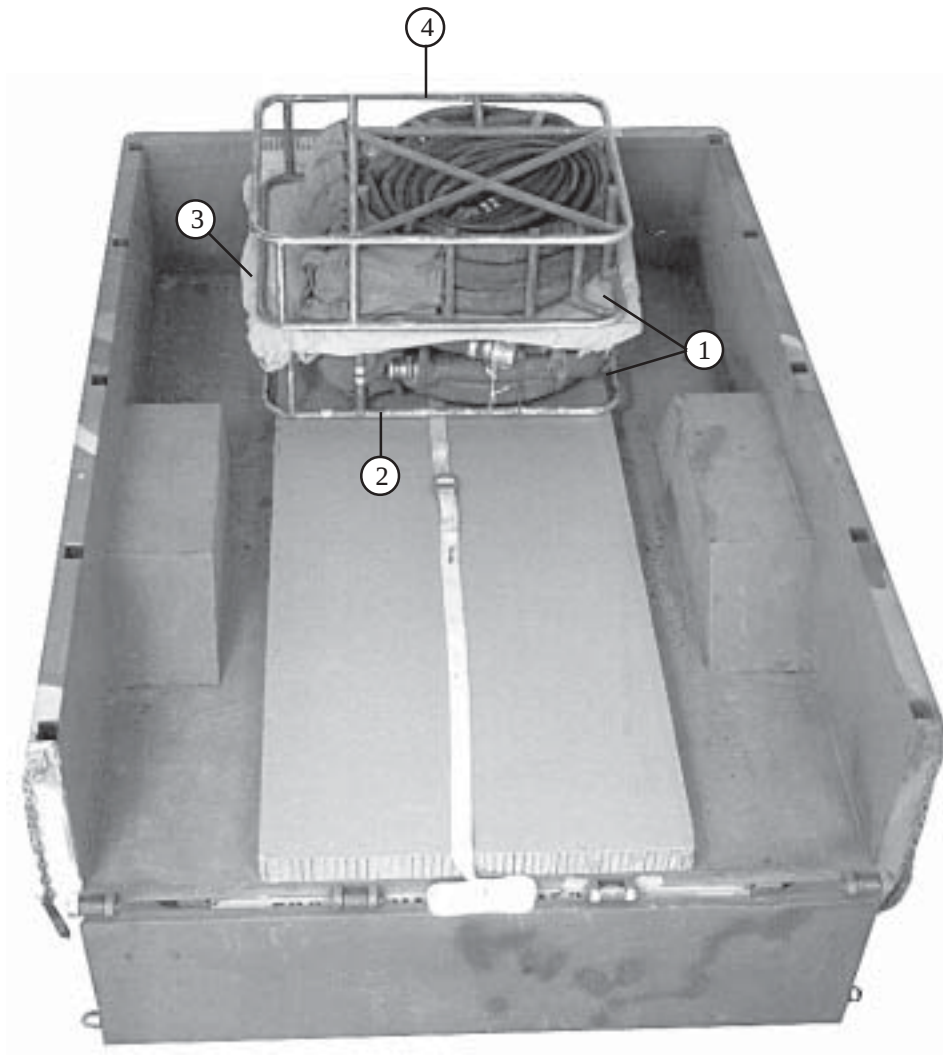
Figure 1-32. Trailer Components Removed

- b. PREPARING TRAILER BEFORE POSITIONING.** Prepare the trailer, and place the components of the FARE in the cargo bed as shown in Figures 1-33 through 1-41.



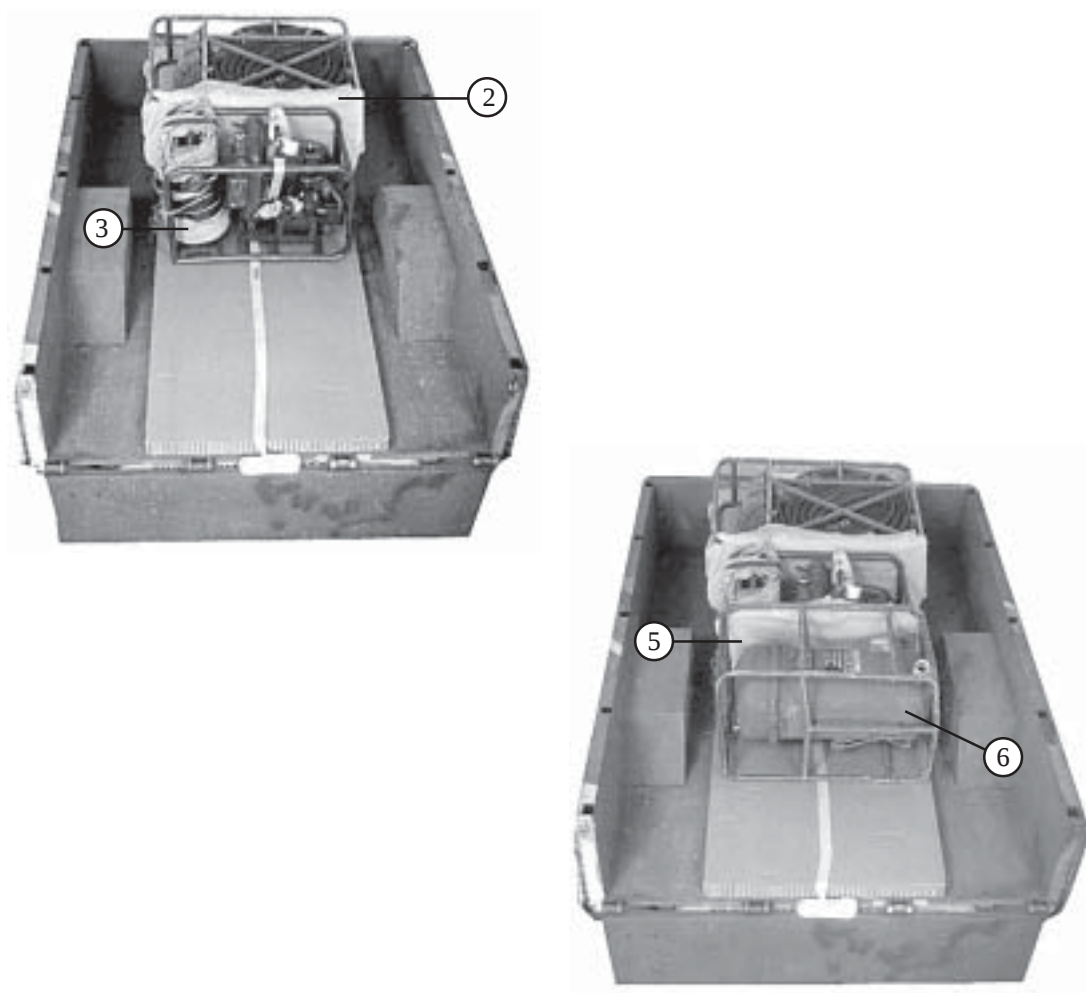
- ① Center a 36- by 96-inch piece of honeycomb in the trailer cargo bed.
- ② Form a 30-foot lashing. Center the lashing on the honeycomb.
- ③ Center an 18- by 38-inch piece of honeycomb against the front wall of the cargo bed.

Figure 1-33. Honeycomb Placed in Cargo Bed



- ① Prepare the discharge hose frame assemblies as shown in Figure 1-7.
Note: Ensure the discharge hose accessory fittings placed in the accessory storage compartment are secured to the discharge hose frame.
- ② Place a discharge hose assembly flush against the 18- by 38-inch piece of honeycomb.
- ③ Place a layer of cellulose wadding on top of the discharge hose frame assembly.
- ④ Place another discharge hose frame assembly on top of the cellulose wadding and flush against the 18- by 38-inch piece of honeycomb.

Figure 1-34. Discharge Hose Frame Assemblies Placed on Honeycomb



- ① Prepare the pump/engine assembly (not shown) according to Figure 1-9.
- ② Place a layer of cellulose wadding against the discharge hose frame assembly.
- ③ Place the pump/engine assembly flush against the discharge hose frame assembly.
- ④ Prepare the filter/separator assembly (not shown) according to Figure 1-8.
- ⑤ Place a layer of cellulose wadding against the pump/engine assembly.
- ⑥ Place the filter/separator assembly flush against the pump/engine assembly.

Figure 1-35. Pump/Engine Assembly Stowed

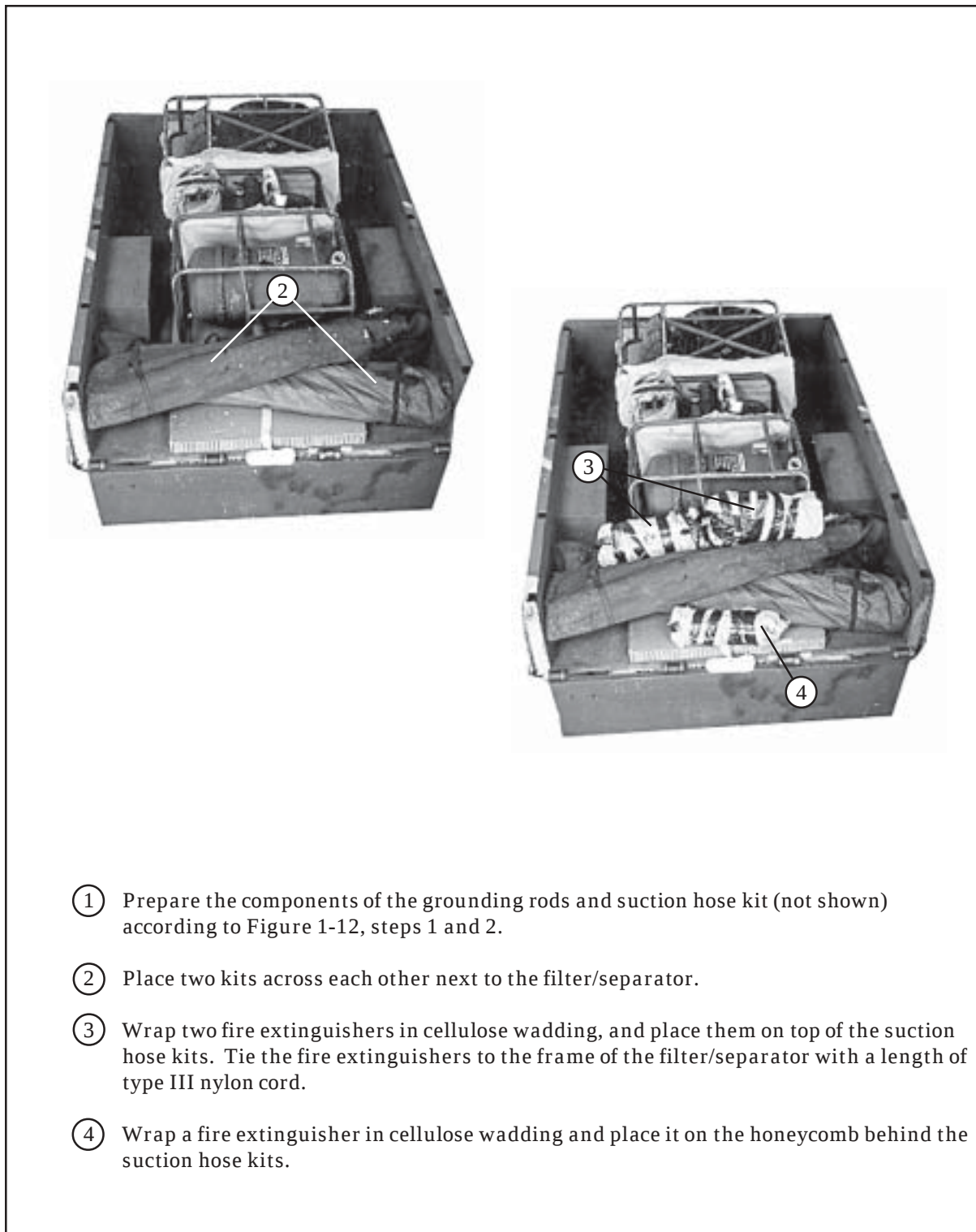


Figure 1-36. Ground Rods, Suction Hose Kits, and Fire Extinguisher Placed on Honeycomb

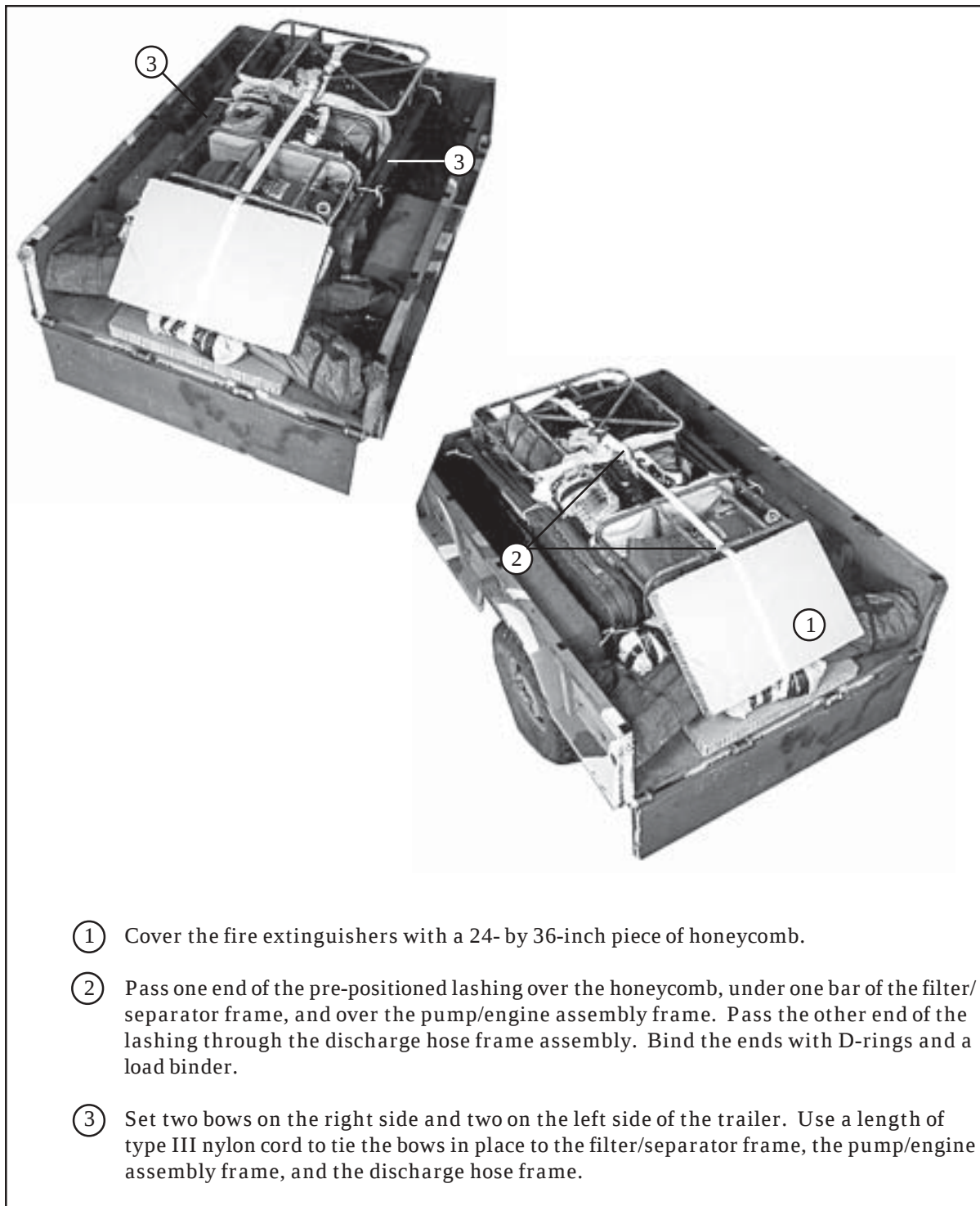


Figure 1-37. Lashing Secured and Bows Tied in Place

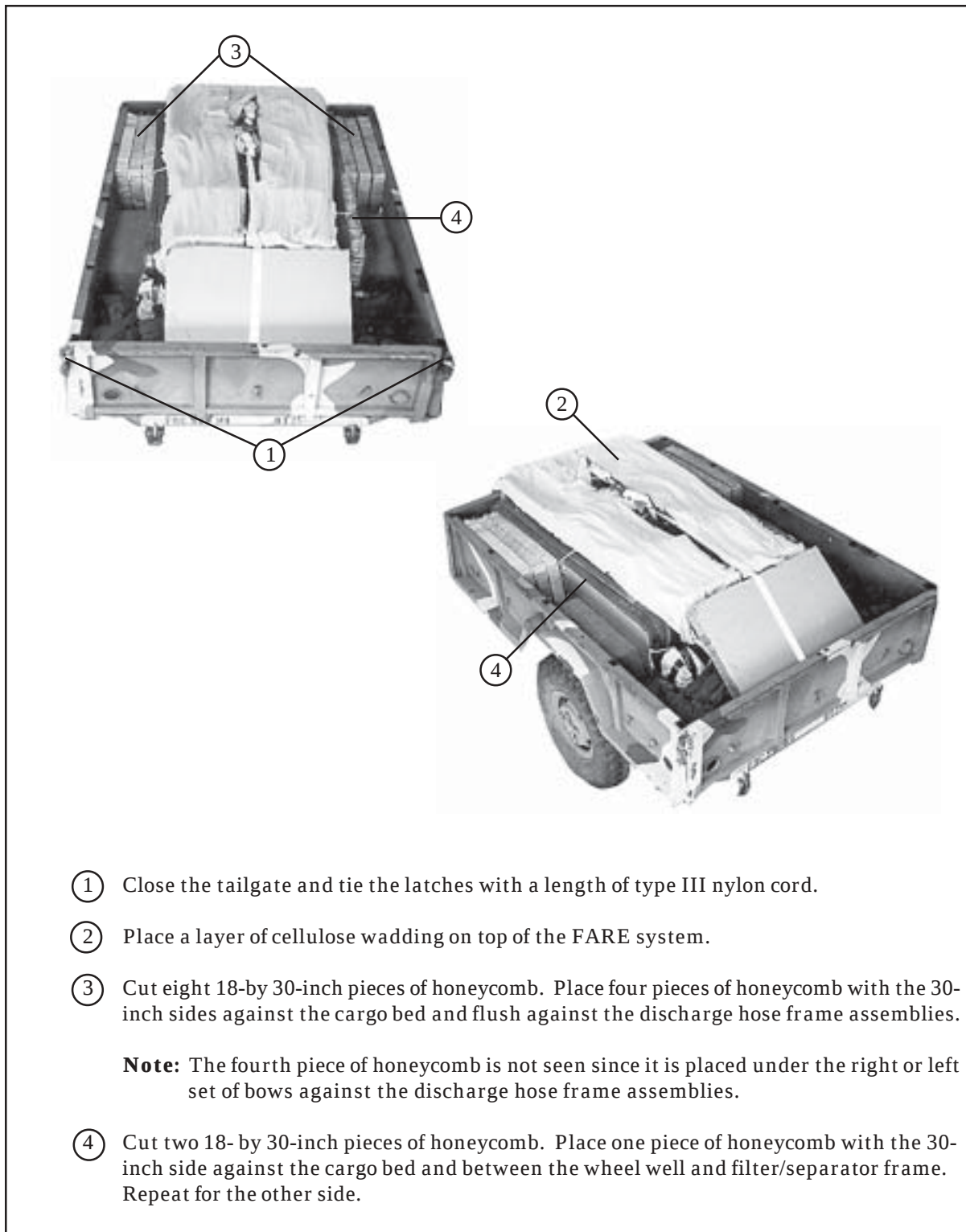


Figure 1-38. Tailgate Secured and Filler Honeycomb Placed in Cargo Bed

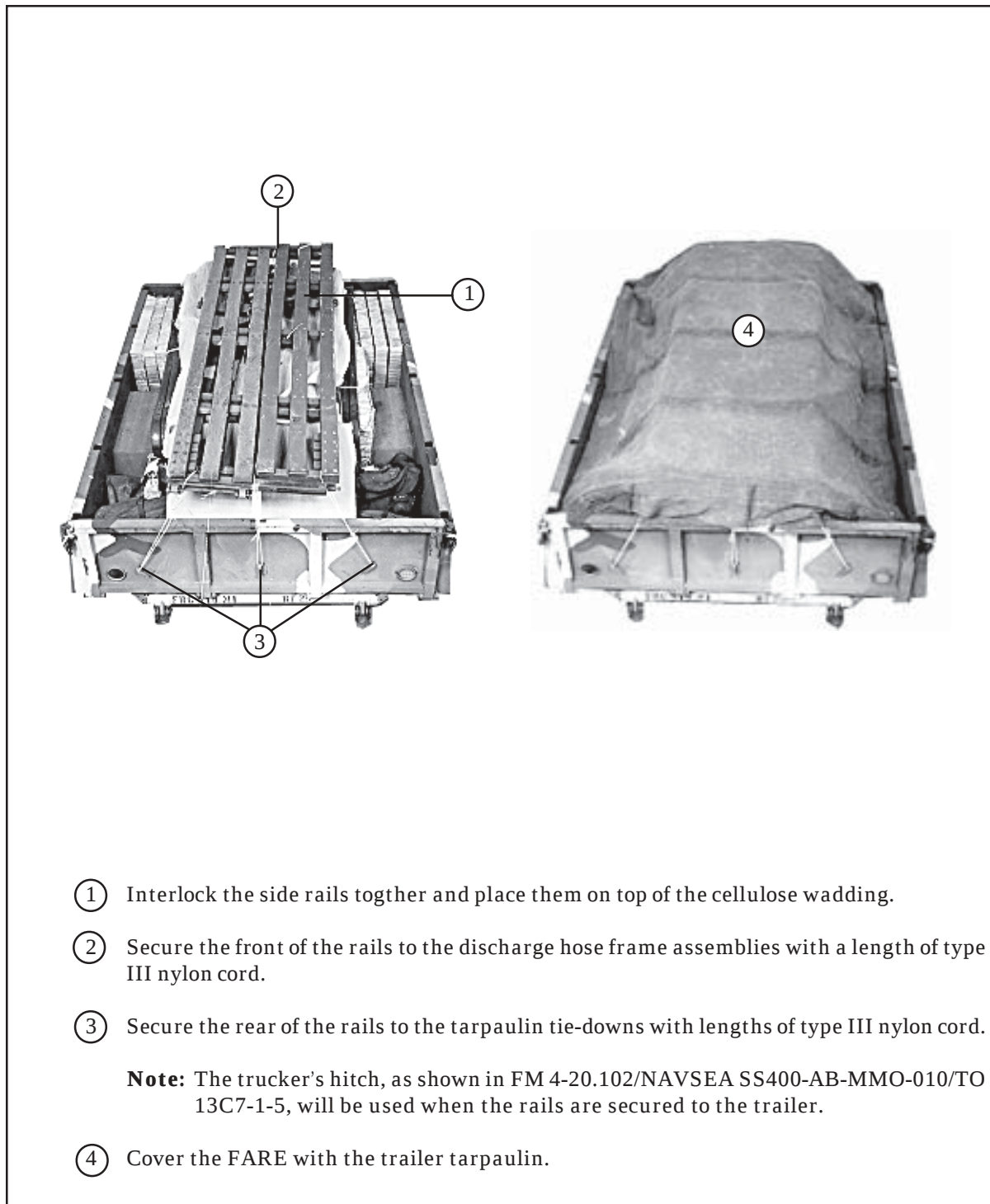


Figure 1-39. Side Rail and Tarpaulin Secured to Trailer

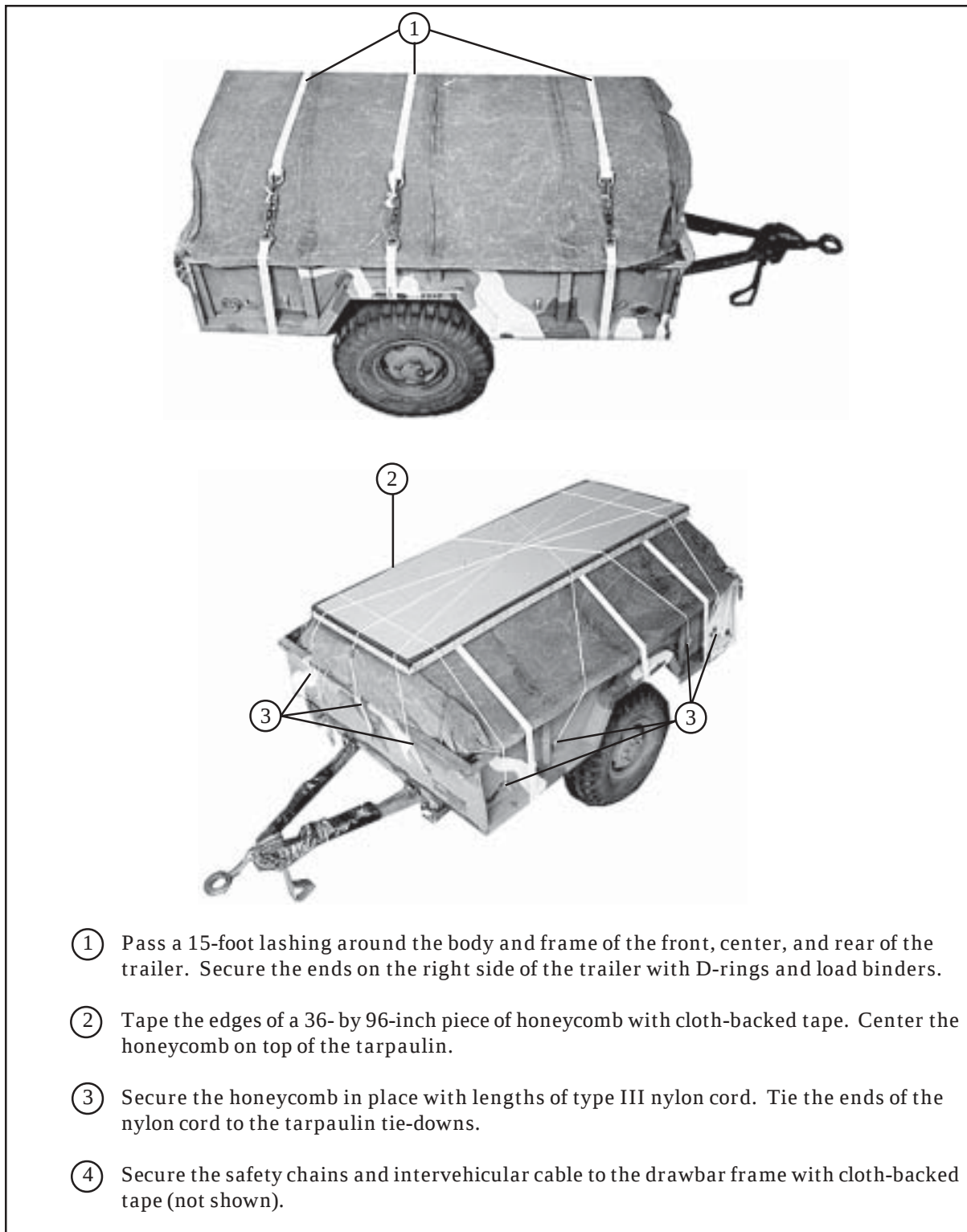


Figure 1-40. FARE Lashed to Trailer and Chains Secured

CAUTION

The brake must be in the off position before the honeycomb can be installed.



- ① Cut a 24- by 60-inch piece of honeycomb. Tape the 24-inch sides with cloth-backed tape. Place the honeycomb on the drawbar.
- ② Secure the honeycomb in place with two lengths of type III nylon cord. Tie the ends of the nylon cord to the tarpaulin tie-downs.
- ③ Secure the support stand in the UP position with a length of type III nylon cord. Make sure the locking pin is in the LOCK position.
- ④ Place two 2- by 12- by 46-inch pieces of lumber between the leaf springs and frame and against the shackle bolts. Tie the lumber to the frame with two lengths of type III nylon cord.

Figure 1-41. Support Stand and Leaf Springs Secured

POSITIONING TRAILER

1-22. Position the trailer on the honeycomb stacks using three medium suspension clevises, two 11-foot (2-loop), type XXVI nylon webbing slings, and one 12-foot (2-loop), type XXVI nylon webbing sling for lifting as shown in Figure 1-42.

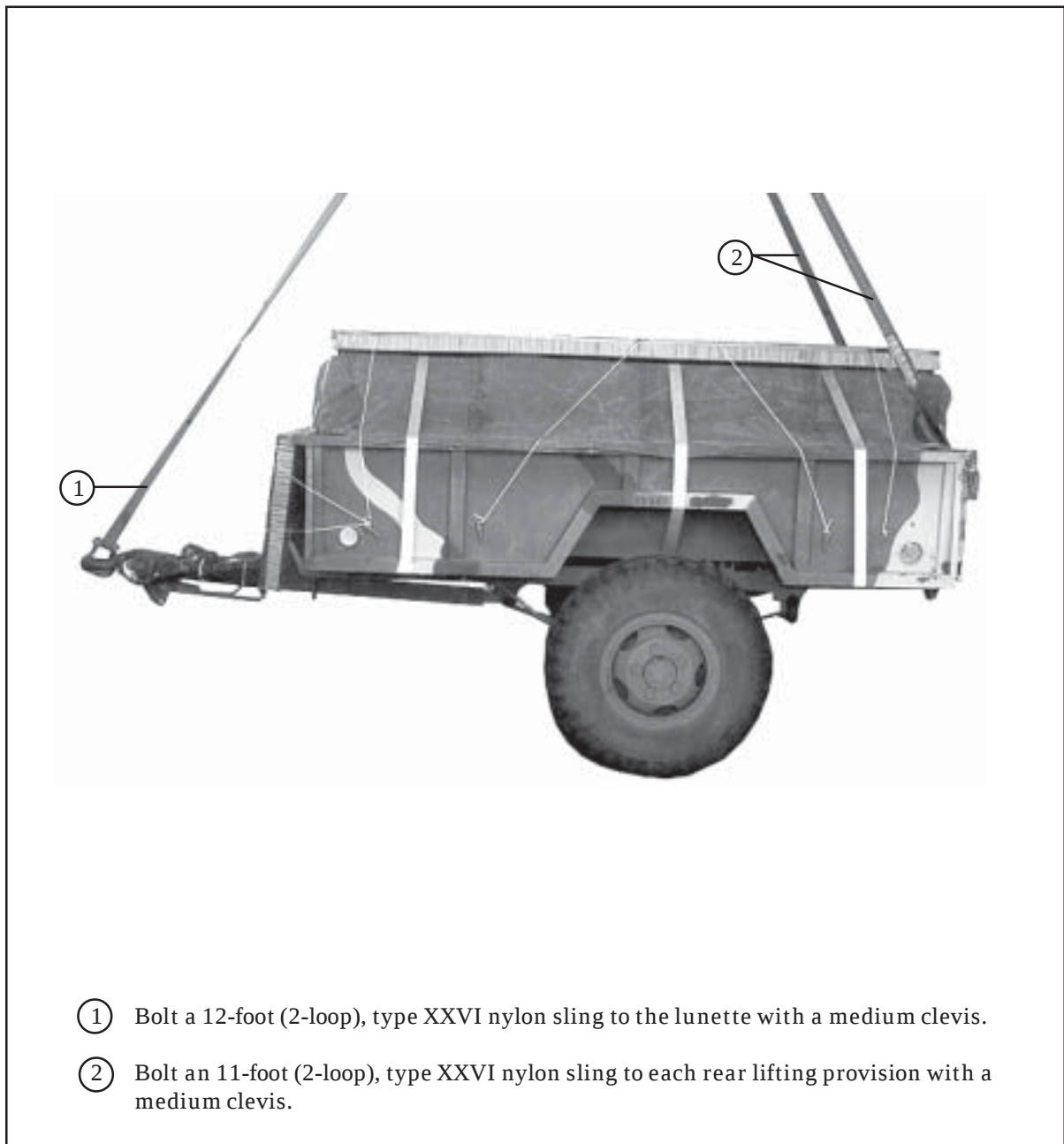
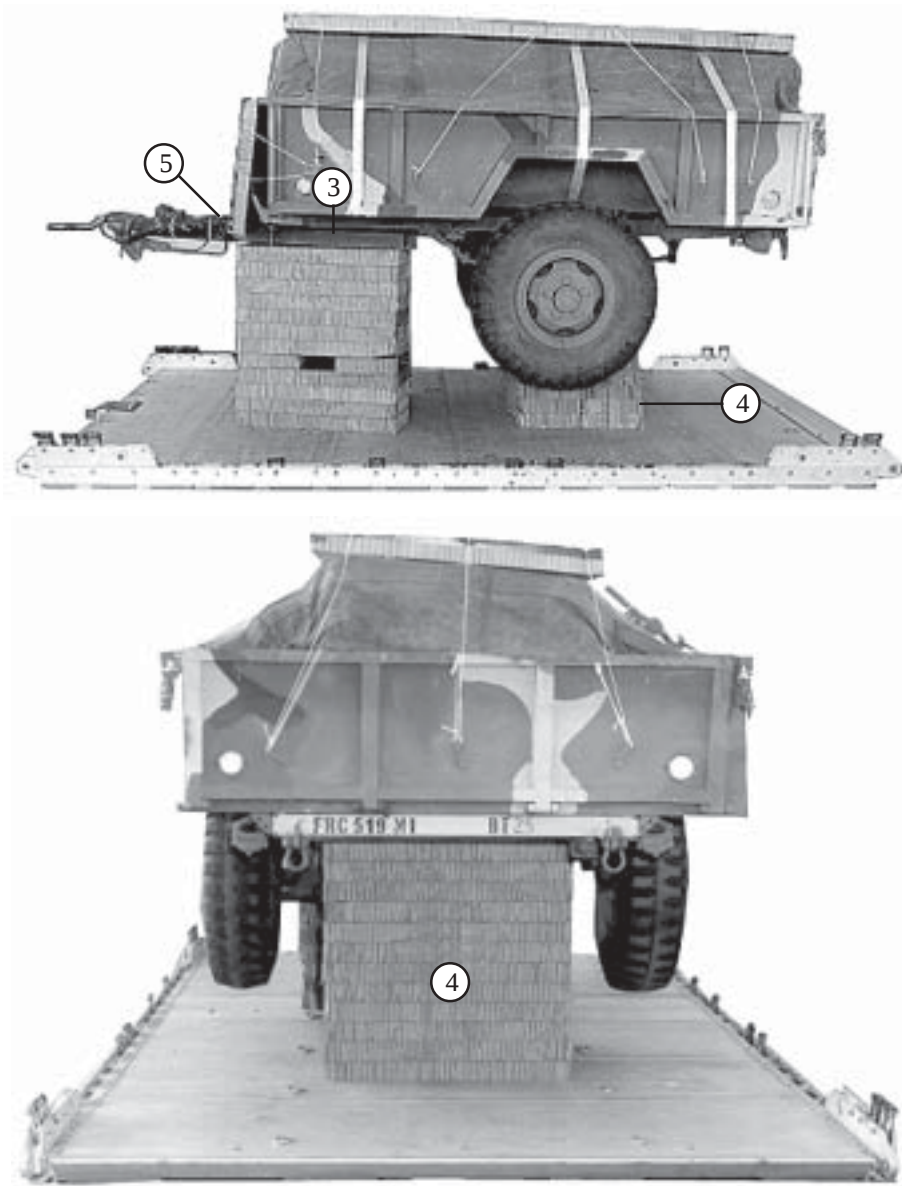


Figure 1-42. Trailer Positioned



- ③ Set the trailer on the honeycomb with the frame support board on stack 3.
- ④ Set the axle on stack 2.
- ⑤ Set the drawbar on stack 3.
- ⑥ Remove the lifting slings (not shown).

Figure 1-42. Trailer Positioned (continued)

LASHING TRAILER

1-23. Lash the trailer to the platform using fourteen 15-foot tie-down assemblies according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-43.

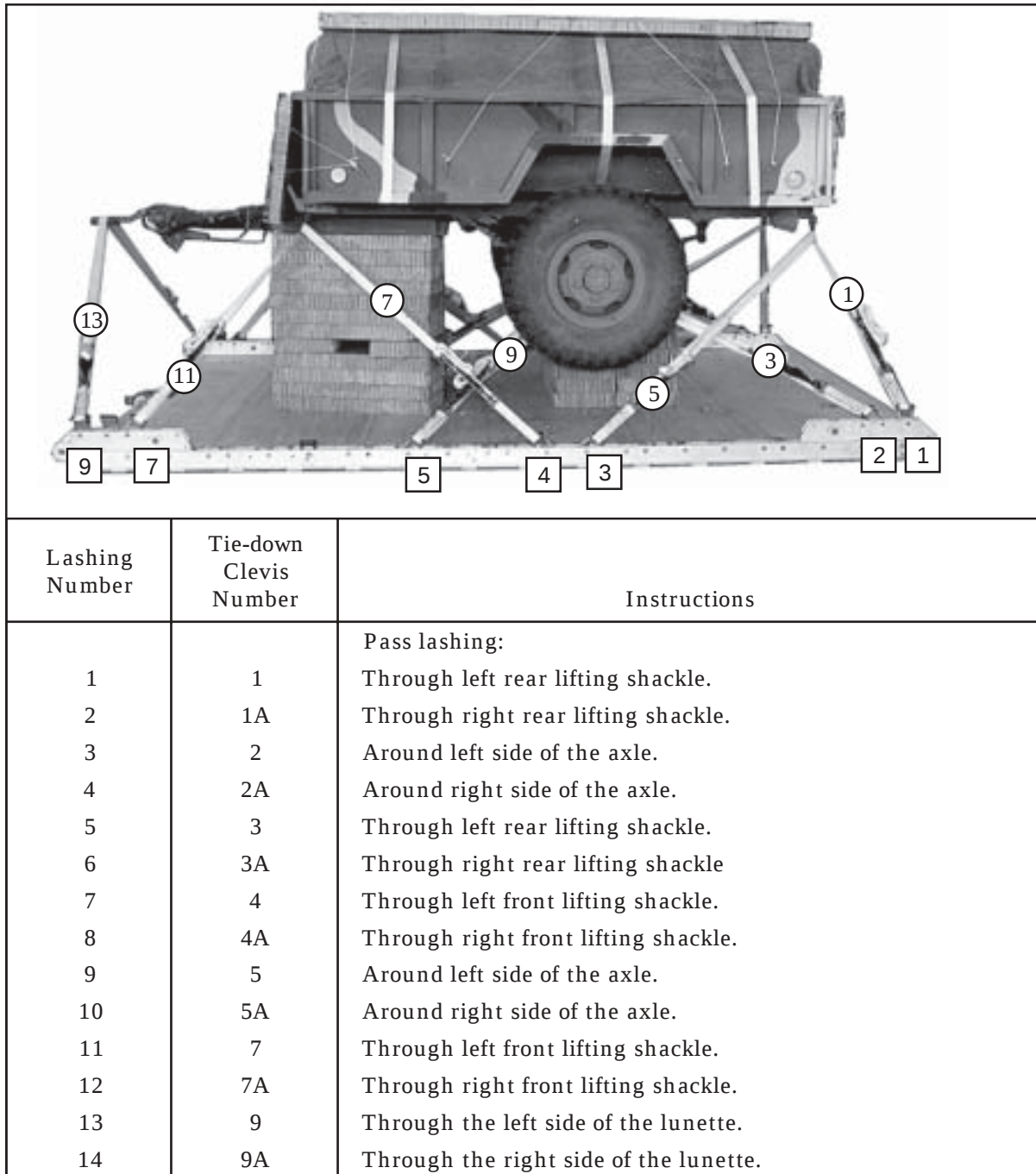
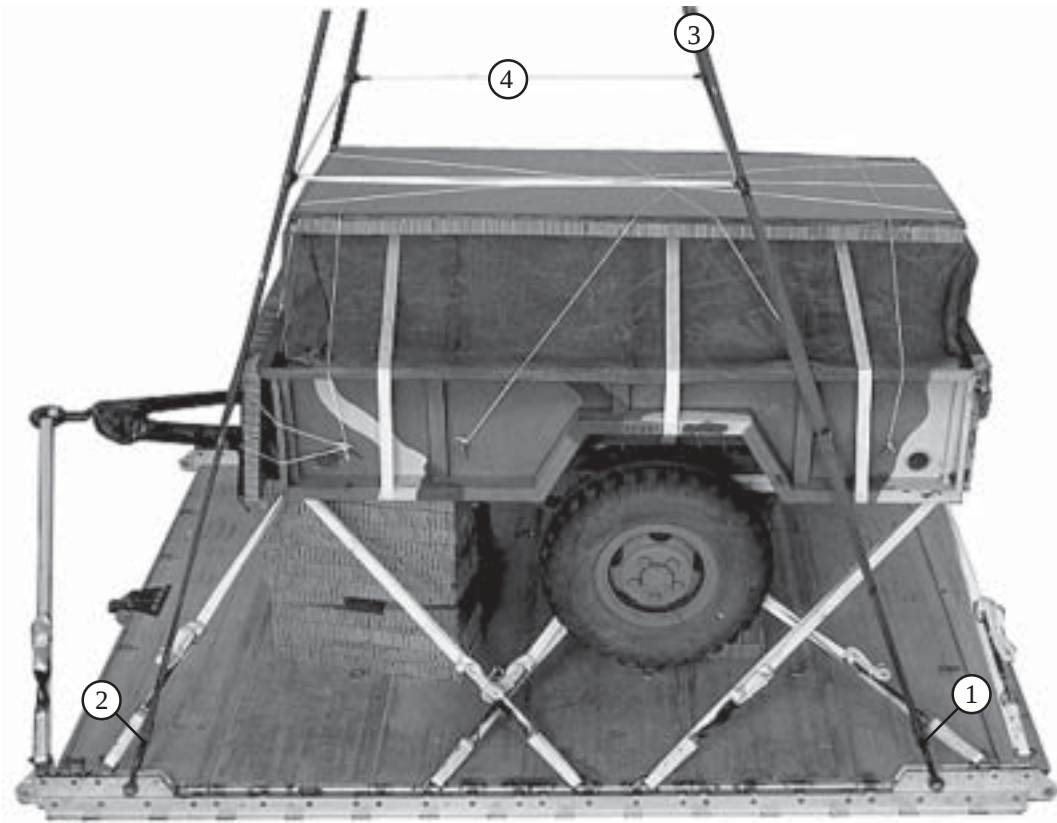


Figure 1-43. Trailer Lashed to Platform

INSTALLING SUSPENSION SLINGS

1-24. Using four large suspension clevises and four 16-foot (2-loop), type XXVI nylon webbing slings for suspension, bolt and safety the slings to the trailer as shown in Figure 1-44.



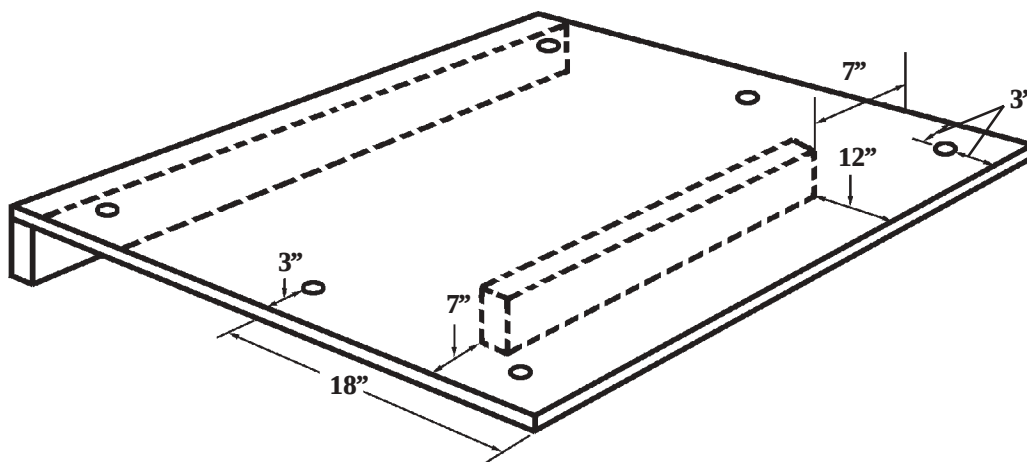
- ① Bolt a 16-foot (2-loop), type XXVI nylon webbing sling to each of the front tandem links with a large suspension clevis.
- ② Bolt a 16-foot (2-loop), type XXVI nylon webbing sling to each of the rear tandem links with a large suspension clevis.
- ③ Raise the suspension slings to their full length with a lifting device.
- ④ Safety the suspension slings with a deadman's tie according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5

Figure 1-44. Suspension Slings Installed

BUILDING AND INSTALLING CARGO PARACHUTE STOWAGE PLATFORM

1-25. Build the parachute stowage platform using a 3/4- by 36- by 36-inch piece of plywood, a 2- by 4- by 36-inch piece of lumber, a 2- by 4- by 22-inch piece of lumber, and eightpenny nails as shown in Figure 1-45. Install the parachute stowage platform using 15-foot tie-down assemblies and as shown in Figure 1-46.

Notes: 1. This drawing is not drawn to scale.
2. The pieces of lumber are nailed to the underside of the plywood.

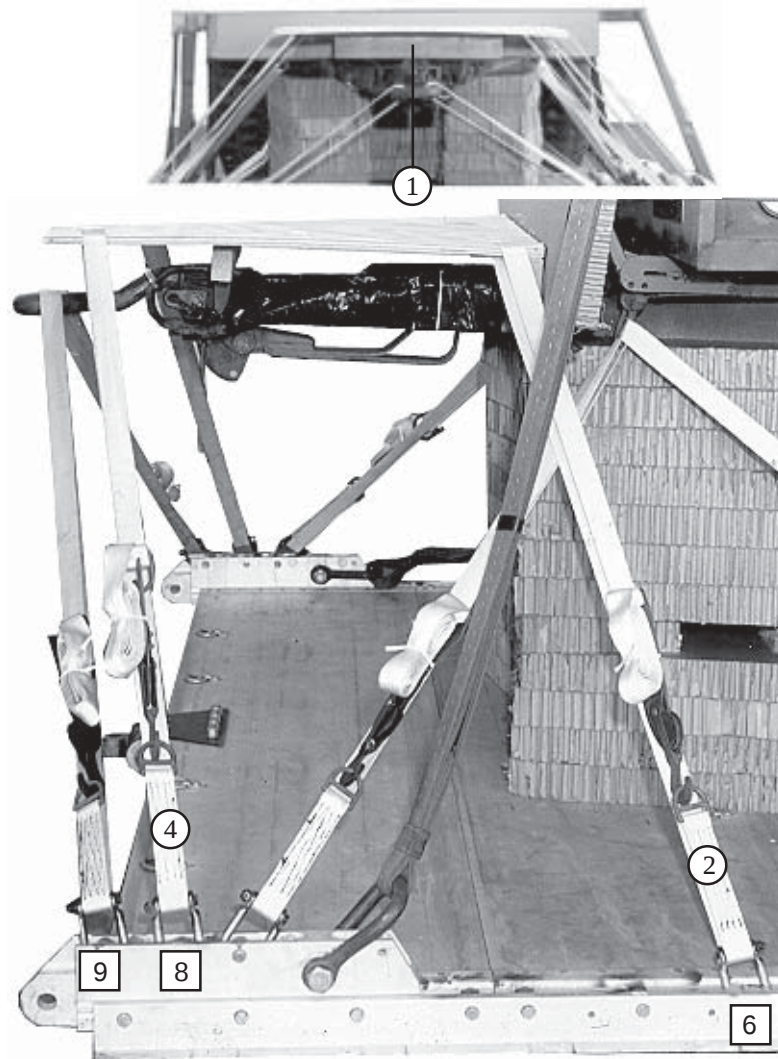


Steps:

1. Drill a 2-inch diameter hole 3 inches from each corner of the 3/4- by 36- by 36-inch plywood.
2. Drill a 2-inch diameter hole centered 3 inches from the sides of the plywood.
3. Place the 2- by 4- by 36-inch lumber on its 2 inch side. Place the lumber on the rear edge of the plywood. Use eightpenny nails to nail the lumber to the plywood.
4. Place the 2- by 4- by 22-inch lumber on its 2 inch side. Center the lumber 12 inches from the front edge of the plywood and 7 inches from each side. Use eightpenny nails to nail the lumber to the plywood.

Figure 1-45. Parachute Stowage Platform Built

Note: Do not tighten the lashing so tight that the plywood bows.



- ① Center the parachute stowage platform on the trailer drawbar.
- ② Pass a 15-foot lashing from clevis 6 up through the front hole in the parachute stowage platform. Secure the lashing with a D-ring and a load binder.
- ③ Repeat step 2 above for clevis 6A (not shown).
- ④ Pass a 15-foot lashing from clevis 8 up through the rear hole in the parachute stowage platform. Secure the lashing with a D-ring and a load binder.
- ⑤ Repeat step 4 above for clevis 8A (not shown).

Figure 1-46. Parachute Stowage Platform Installed

STOWING CARGO PARACHUTES

1-26. Stow one G-11 cargo parachute according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-47.

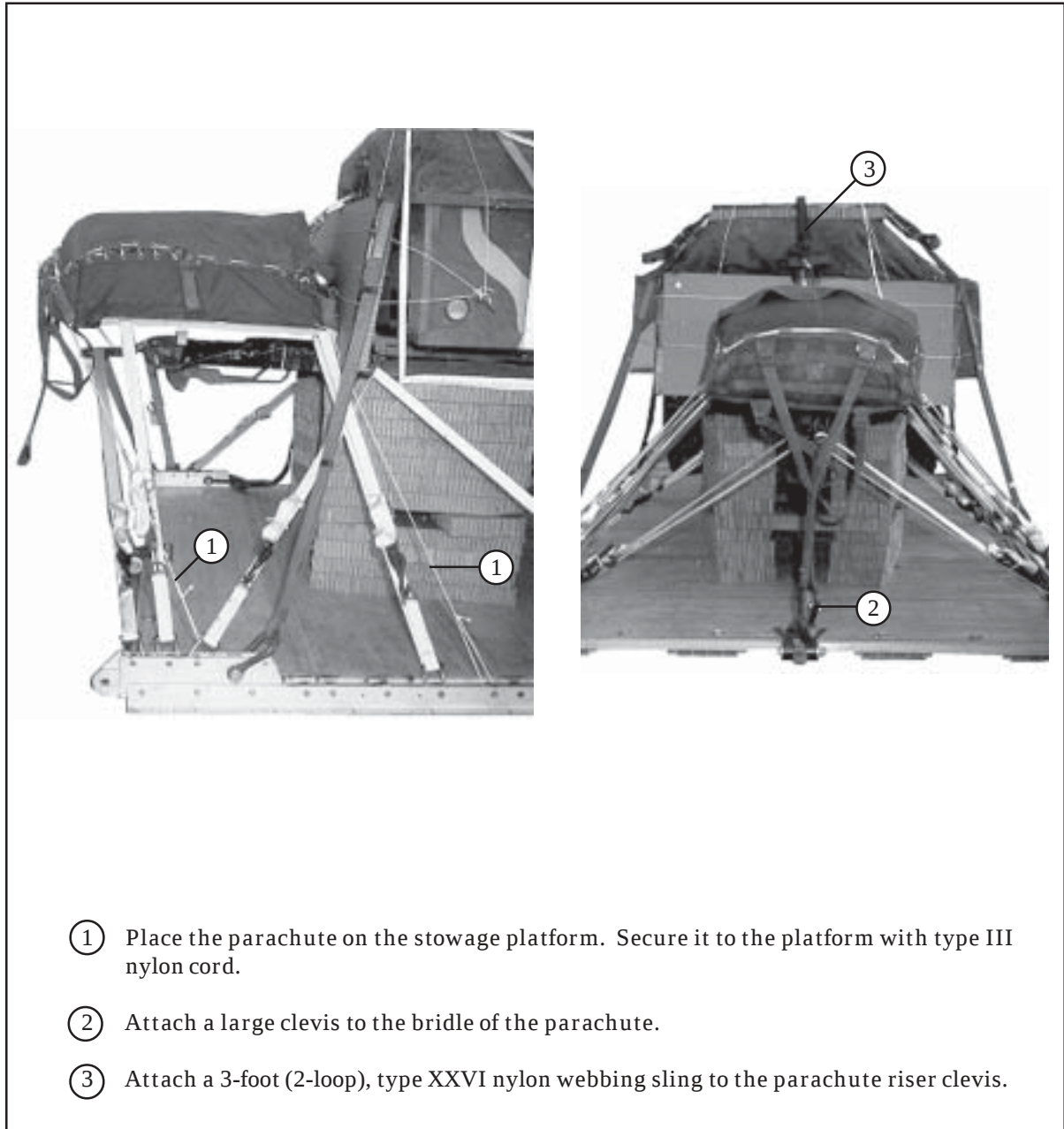
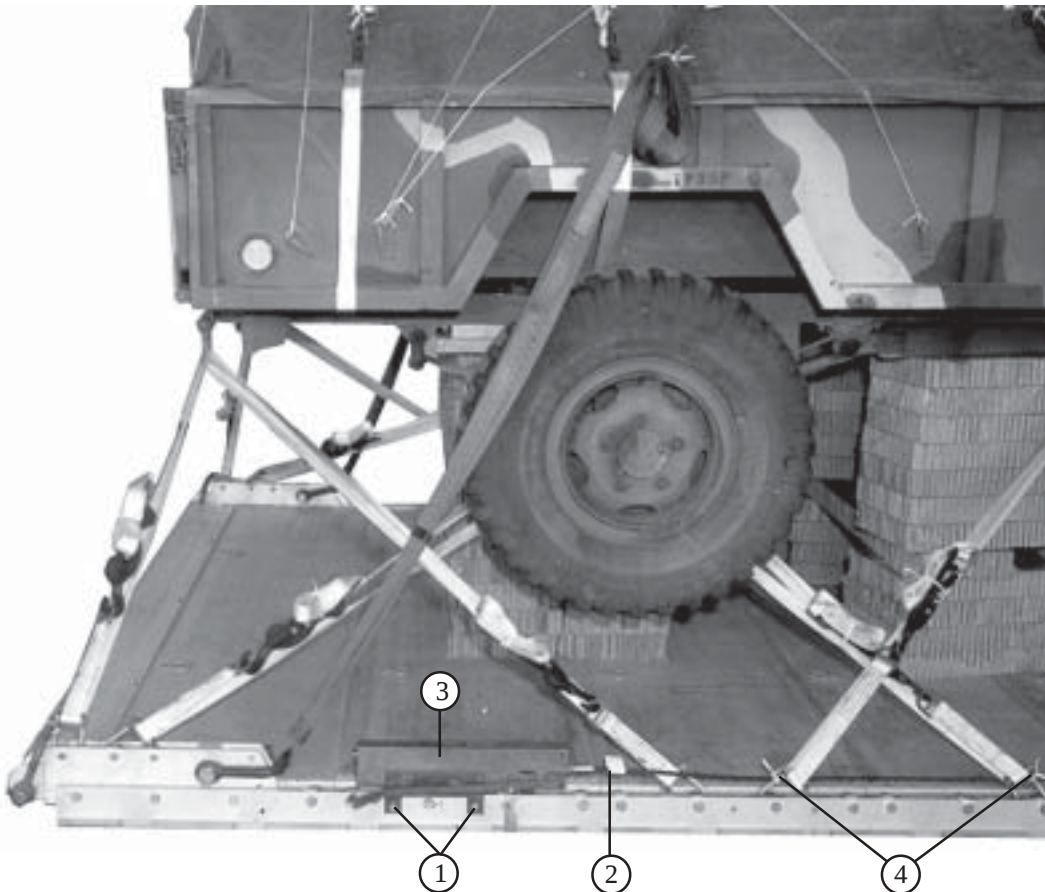


Figure 1-47. Cargo Parachute Stowed

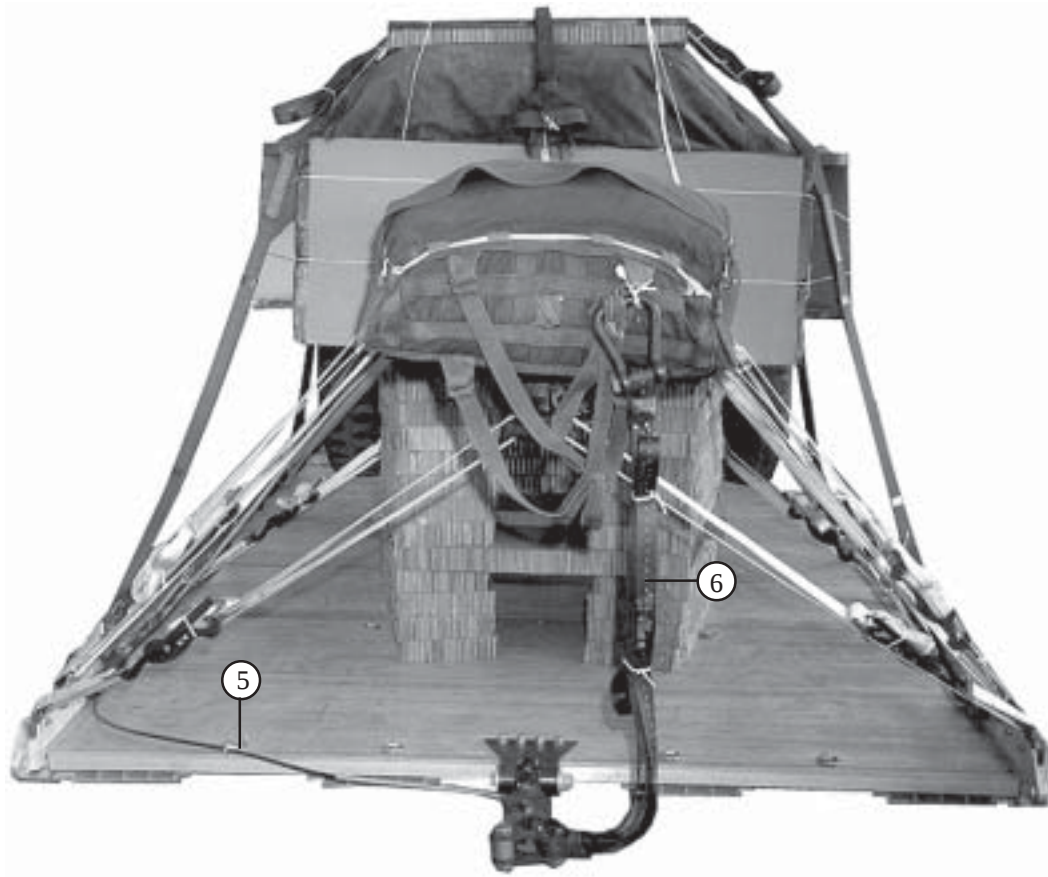
INSTALLING EXTRACTION SYSTEM

1-27. Install the EFTC extraction system according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-48.



- ① Bolt the actuator bracket to the front EFTC mounting holes on the left platform side rail.
- ② Install a 12-foot cable to the actuator assembly.
- ③ Install the actuator in the actuator mounting brackets.
- ④ Route the cable along the left rail to the rear of the platform. Tie the cable to clevises 4 and 5 with type I, 1/4-inch cotton webbing.

Figure 1-48. EFTC Installed

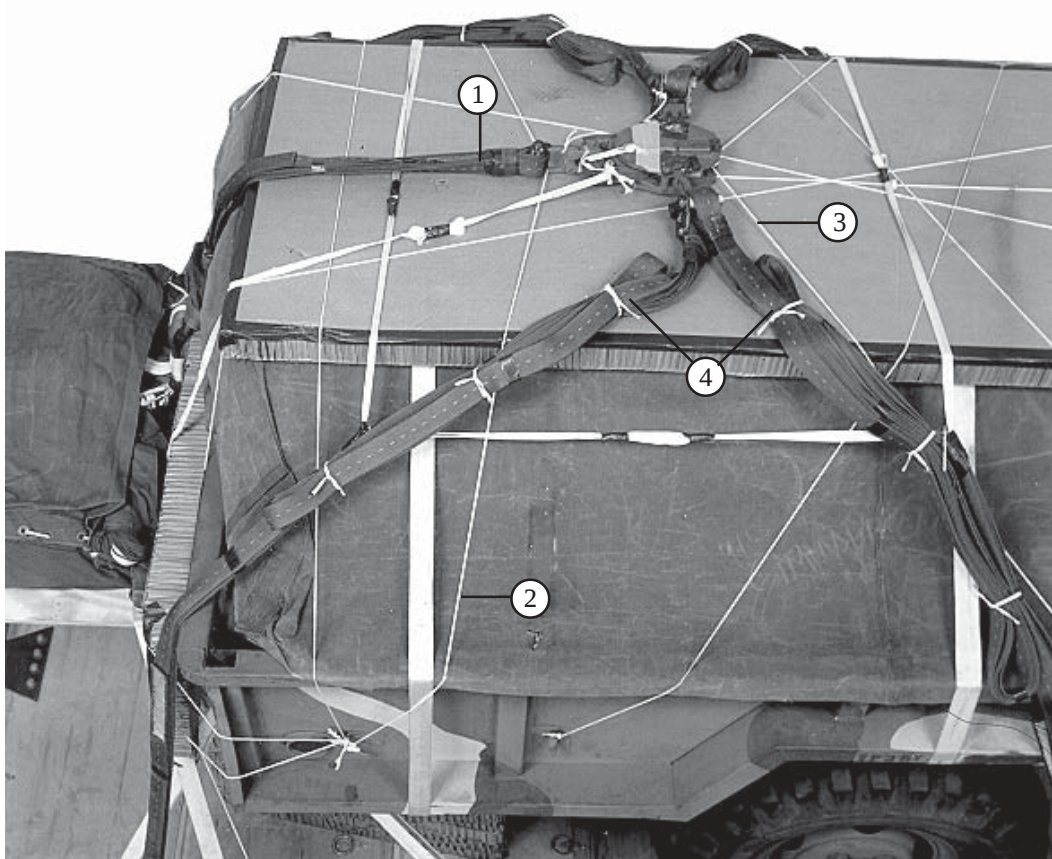


- ⑤ Tie the cable to tie-down ring D6 with type I, 1/4-inch cotton webbing. Bolt the latch assembly to the extraction line as shown in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
- ⑥ Use a 9-foot (2-loop), type XXVI nylon webbing sling for the deployment line.

Figure 1-48. EFTC Installed (continued)

INSTALLING PARACHUTE RELEASE SYSTEM

1-28. Prepare and install the M-1 release assembly according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-49.



- ① Attach the pre-positioned 3-foot sling to the M-1 release. Place the release on the honeycomb.
- ② Secure the release to the tarpaulin tie-downs at the front of the trailer with type III nylon cord.
- ③ Secure the release to the tarpaulin tie-downs at the rear of the trailer with type III nylon cord.
- ④ Attach the 16-foot (2-loop) nylon webbing suspension slings to the release. S-fold and tie the slings in place with type I, 1/4-inch cotton webbing as outlined in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

Figure 1-49. M-1 Cargo Parachute Release Installed

PLACING EXTRACTION PARACHUTE

1-29. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

1-30. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

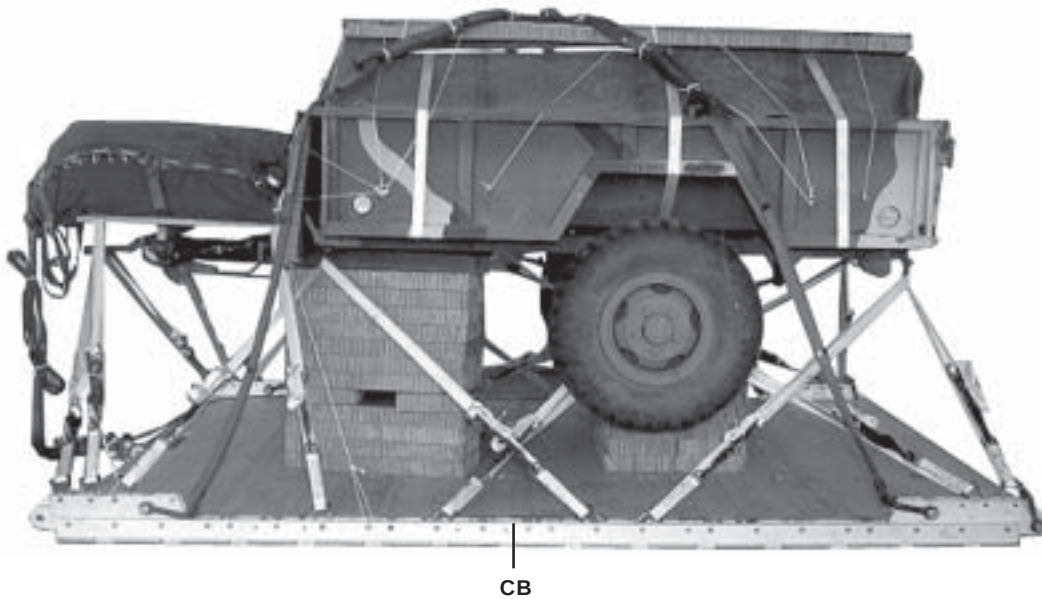
1-31. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-50. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

1-32. Use the equipment list in Table 1-3 to rig the load shown in Figure 1-50.

CAUTION:

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.



RIGGED LOAD DATA

Weight	4,050 pounds
Maximum Weight	5,000 pounds
Height	83 inches
Width	108 inches
Overall Length	162 inches
Overhang: Front	0 inches
Rear (EFTC)	18 inches
Center of Balance (CB) (from front edge of platform)	72 1/2 inches
Extraction System	EFTC

Figure 1-50. FARE in an M101 Series, 3/4-Ton Trailer Rigged for Low-Velocity Airdrop

**Table 1-3. Equipment Required for Rigging FARE in an M101, 3/4-Ton Trailer
Low-Velocity Airdrop**

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive, paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	5
4030-00-678-8562	Clevis, medium	2
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5783	Coupling, airdrop, extraction force transfer with cable, 12-ft	1
1670-00-360-0328	Cover: Clevis, large	1
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
5365-00-937-0147	D-ring, heavy-duty, 10,000-lb	2
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, parachute bag (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add 1 for DES)	2
1670-01-064-4452	Line, drogue (for DES) 60-ft (1-loop), type XXVI	1
1670-01-064-4452	Line, extraction:	1
1670-01-107-7652	For C-141: 160-ft (1-loop), type XXVI	1
1670-01-107-7652	For C-5: 160-ft, (1-loop), type XXVI	1
1670-01-107-7652	For C-17: 160-ft (1-loop), type XXVI	1
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1
	Link Assembly: (double the quantity for DES)	
	Two-point:	1
5306-00-435-8994	Bolt, 1-in diam, 4-in long	(2)
5310-00-232-5165	Nut, 1-in, hexagonal	(2)
1670-00-003-1953	Plate, side, 3 3/4-in	(2)
5365-00-007-3414	Spacer, large	(2)
5510-00-220-6146	Lumber, 2- by 4-in:	
	22-inch	1
	36-inch	1
5510-00-220-6250	Lumber, 2- by 12- by 46-in	2
5315-00-010-4659	Nail, steel wire, 8d	As required

**Table 1-3. Equipment Required for Rigging FARE in an M101, 3/4-Ton Trailer
Low-Velocity Airdrop (continued)**

National Stock Number	Item	Quantity
1670-00-753-3928	Pad, energy-dissipating (honeycomb) 3- by 36- by 96-in	11 sheets
1670-01-016-7841	Parachute: Cargo: G-11B	1
1670-01-063-37165	Cargo extraction: 15-ft	1
1670-01-063-3715	Drogue (for DES) 15-ft	1
1670-01-353-8425	Platform, airdrop, type V, 12-ft: Bracket assembly, coupling	(1)
1670-01-162-2372	Clevis assembly, type V	(44)
1670-01-162-2376	Extraction bracket assembly	(1)
1670-01-162-2381	Tandem link assembly (Multipurpose link)	(4)
5530-00-128-4981	Plywood, 3/4-in	3 sheets
1670-01-097-8816	Release, cargo parachute, M-1	1
1670-01-063-7761	Sling, cargo, airdrop For suspension: 16-ft (2-loop), type XXVI nylon webbing	4
1670-01-063-7760	For lifting: 11-ft (2-loop), type XXVI nylon webbing	2
1670-01-062-6303	12-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-6304	For deployment: 9-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-63021	For riser extension: 3-ft (2-loop), type XXVI nylon webbing	1
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	23
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Type VIII	As required

SECTION III- RIGGING FARE IN AN M998 , 1 1/4-TON TRUCK (HMMWV)

DESCRIPTION OF LOAD

1-33. The M998, 1 1/4-ton truck is rigged on a 16-foot, type V airdrop platform for low-velocity airdrop. Except for the rigging procedures in this chapter, the truck is rigged according to FM 4-20.117/TO 13C7-1-111. The FARE is stowed in the cargo bed of the truck as an accompanying load. The FARE weighs 860 pounds. The completely rigged load requires two G-11 cargo parachutes. Required equipment is listed Table 1-4.

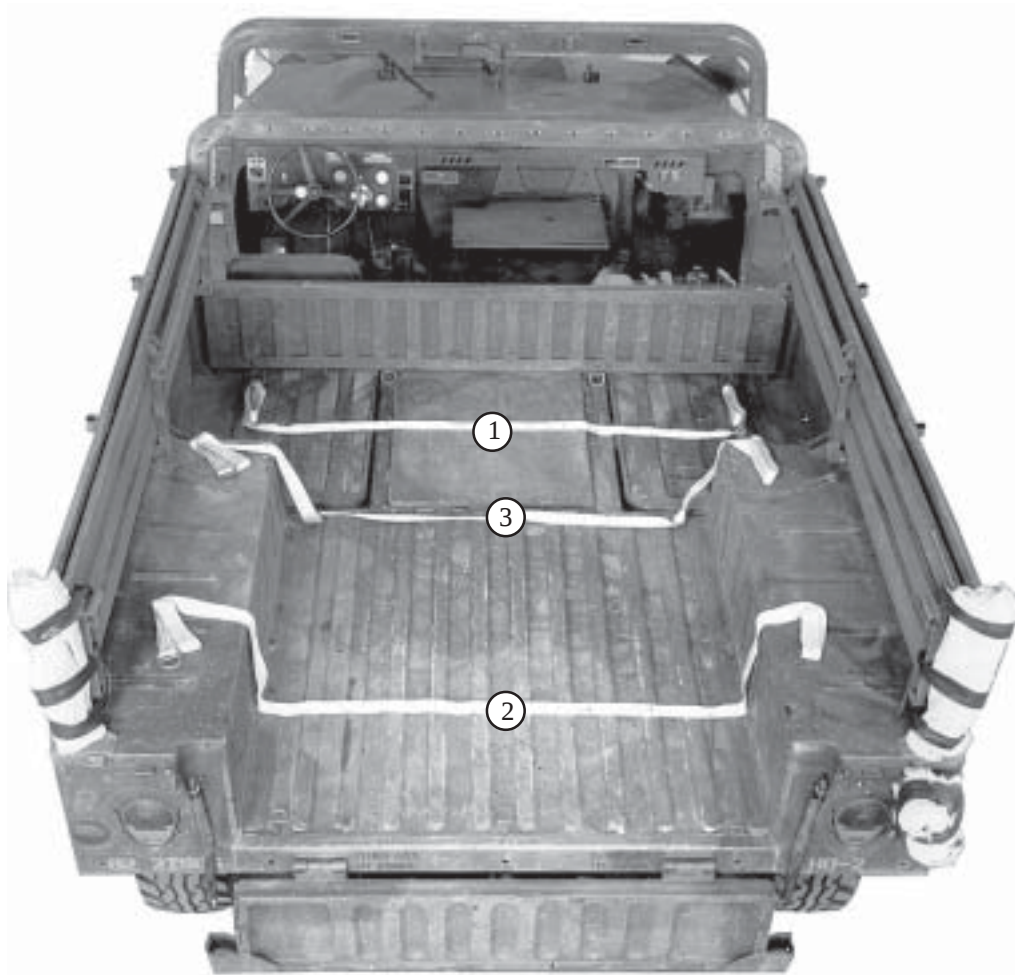
PREPARING PLATFORM AND TRUCK

1-34. Prepare the platform and the M998 truck according to FM 4-20.117/TO 13C7-1-111.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

PREPARING CARGO BED

1-35. Prepare the cargo bed of the M998 as shown in Figure 1-51.



- ① Lay a 15-foot lashing across the cargo bed 14 inches from the back of the seats.
- ② Lay a 15-foot lashing across the cargo bed 18 inches from the rear edge of the cargo bed.
- ③ Pass a 15-foot lashing through the center tie-down rings.

Figure 1-51. Cargo Bed Prepared

PLACING FARE IN CARGO BED

1-36. Place the FARE in the cargo bed of the M998 as shown in Figure 1-52.

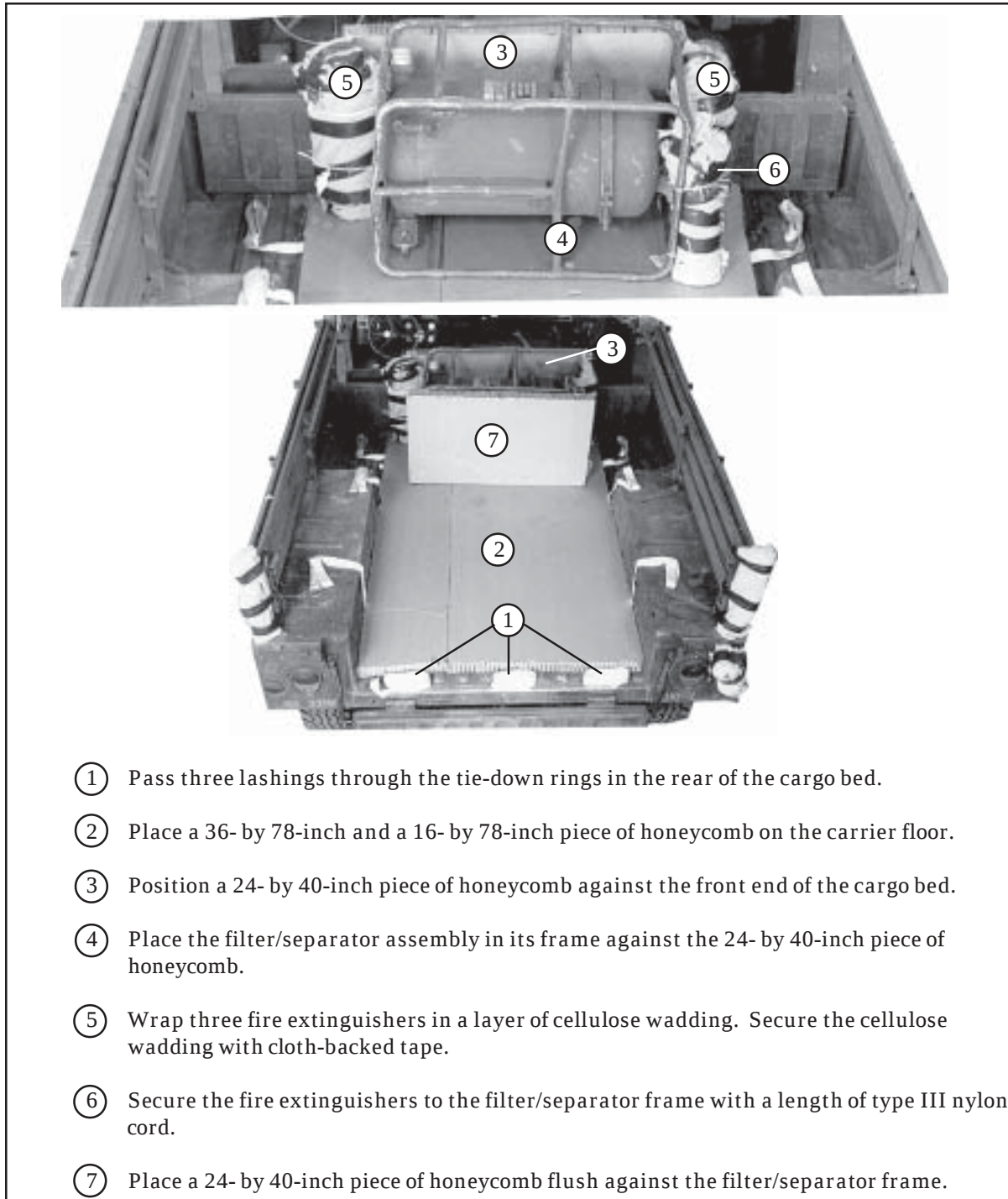
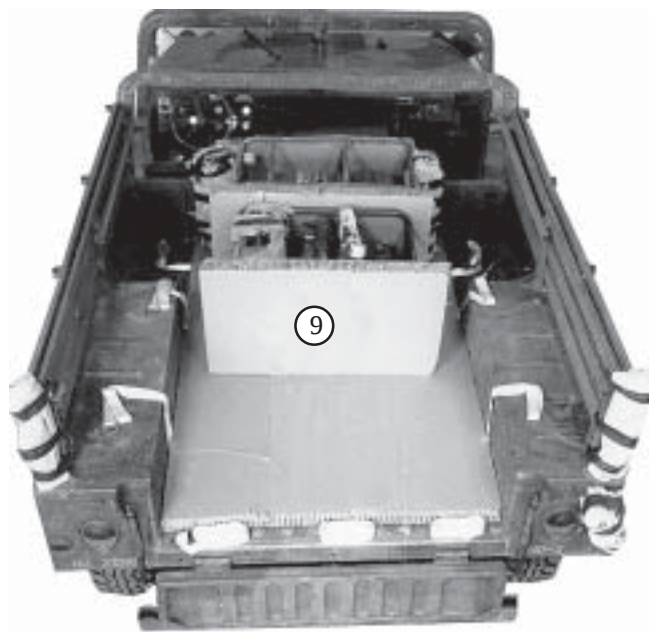
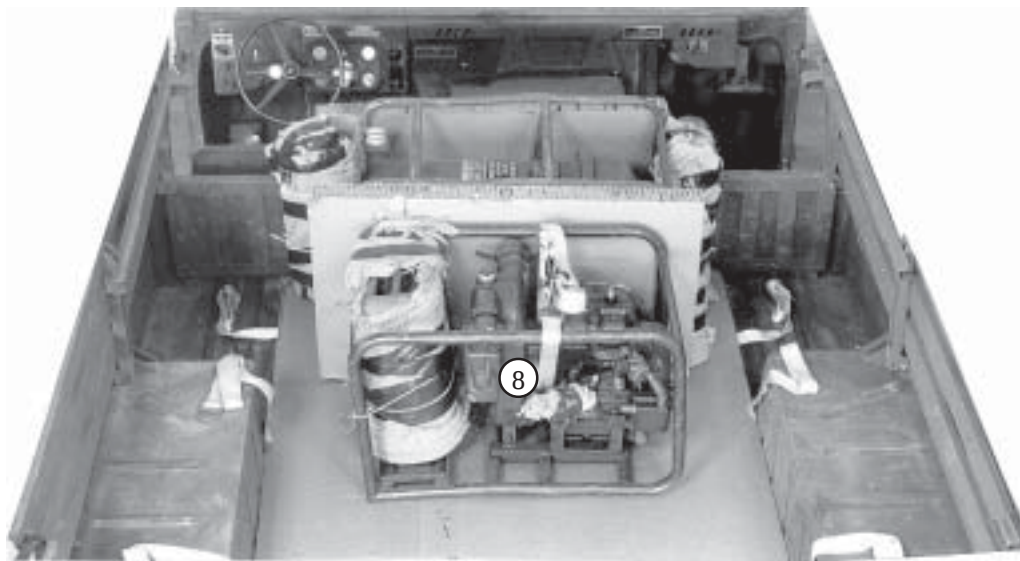
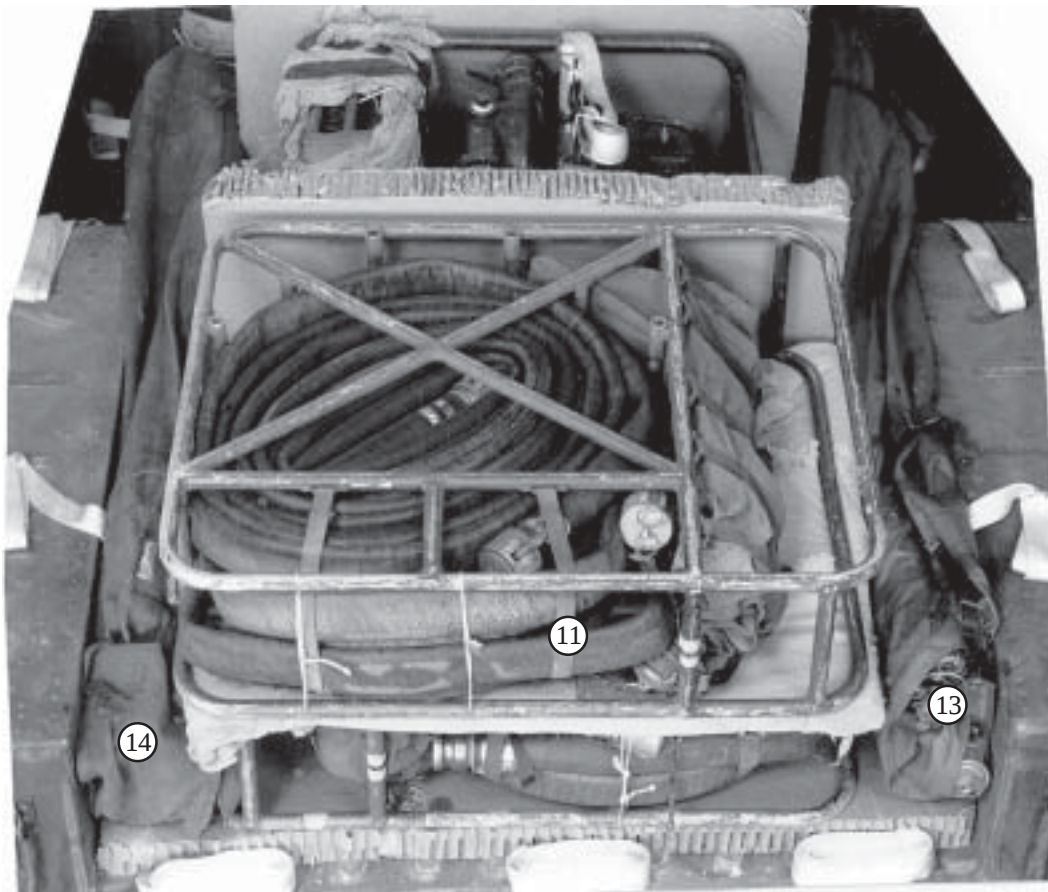


Figure 1-52. FARE Placed in Cargo Bed



- ⑧ Prepare the pump/engine assembly as shown in Figure 1-9. Place the pump/engine assembly flush against the 24- by 40-inch piece of honeycomb placed in step 7.
- ⑨ Place a 24- by 40-inch piece of honeycomb against the pump/seperator assembly.

Figure 1-52. FARE Placed in Cargo Bed (continued)



⑩ Prepare the discharge hose assemblies as shown in Figure 1-7, steps 1 and 2.

⑪ Place one discharge hose frame assembly on the honeycomb in the cargo bed. Place a layer of cellulose wadding on top of the frame. Place another discharge hose frame assembly on top of the cellulose wadding.

Note: Ensure the discharge hose accessory fittings placed in the accessory storage compartment are secured to the discharge hose frame.

⑫ Prepare the ground rods and suction hoses as shown in Figure 1-12, steps 1 and 2.

⑬ Place a suction hose bag on the right side of the FARE on top of the honeycomb in the cargo bed.

⑭ Place a suction hose bag on the left side of the FARE on top of the honeycomb in the cargo bed.

Figure 1-52. FARE Placed in Cargo Bed (continued)

SECURING FARE

1-37 Secure the FARE in the cargo bed of the M998 using the pre-positioned lashings. Secure the lashings with D-rings and load binders according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-53.

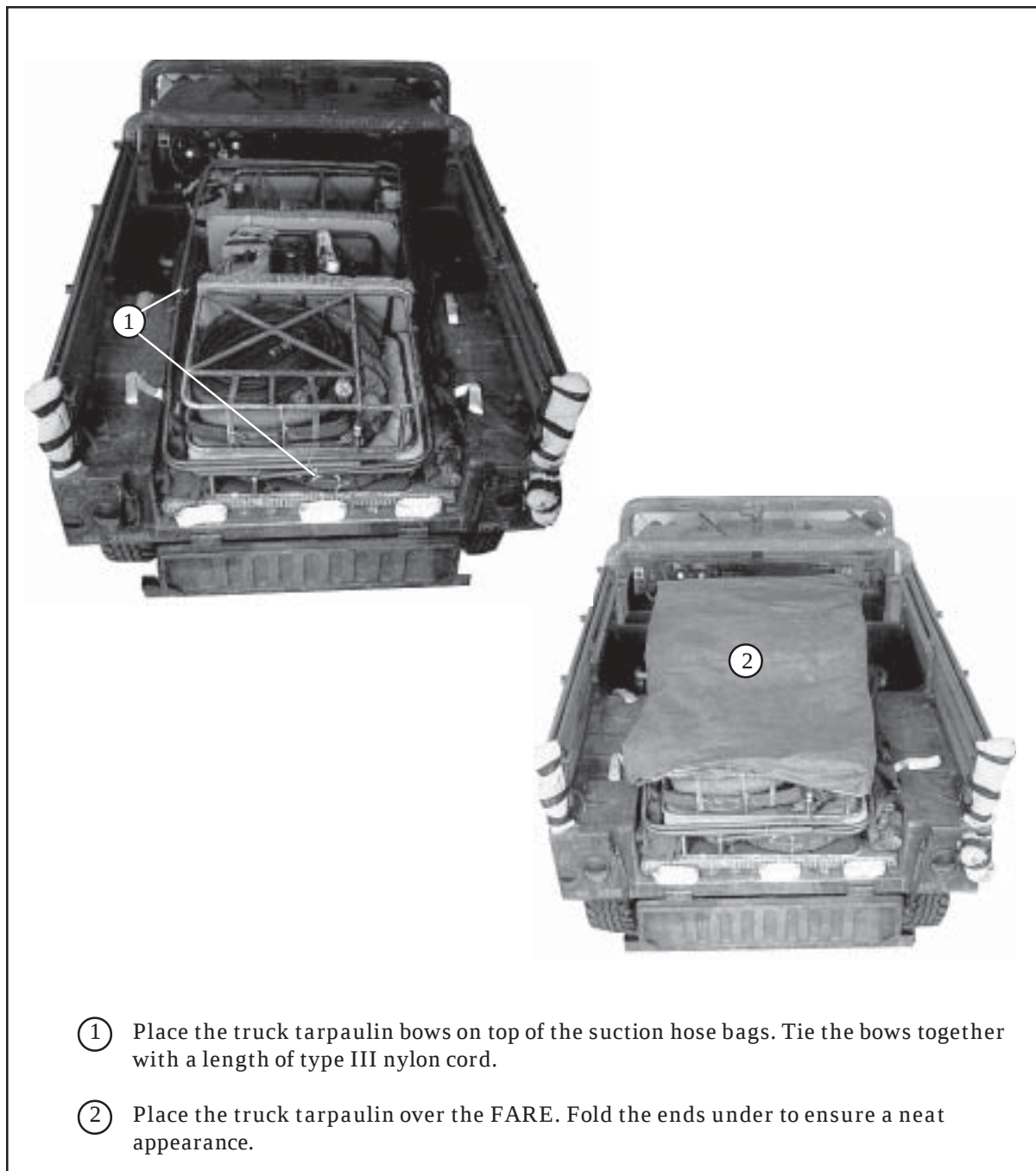


Figure 1-53. FARE Secured

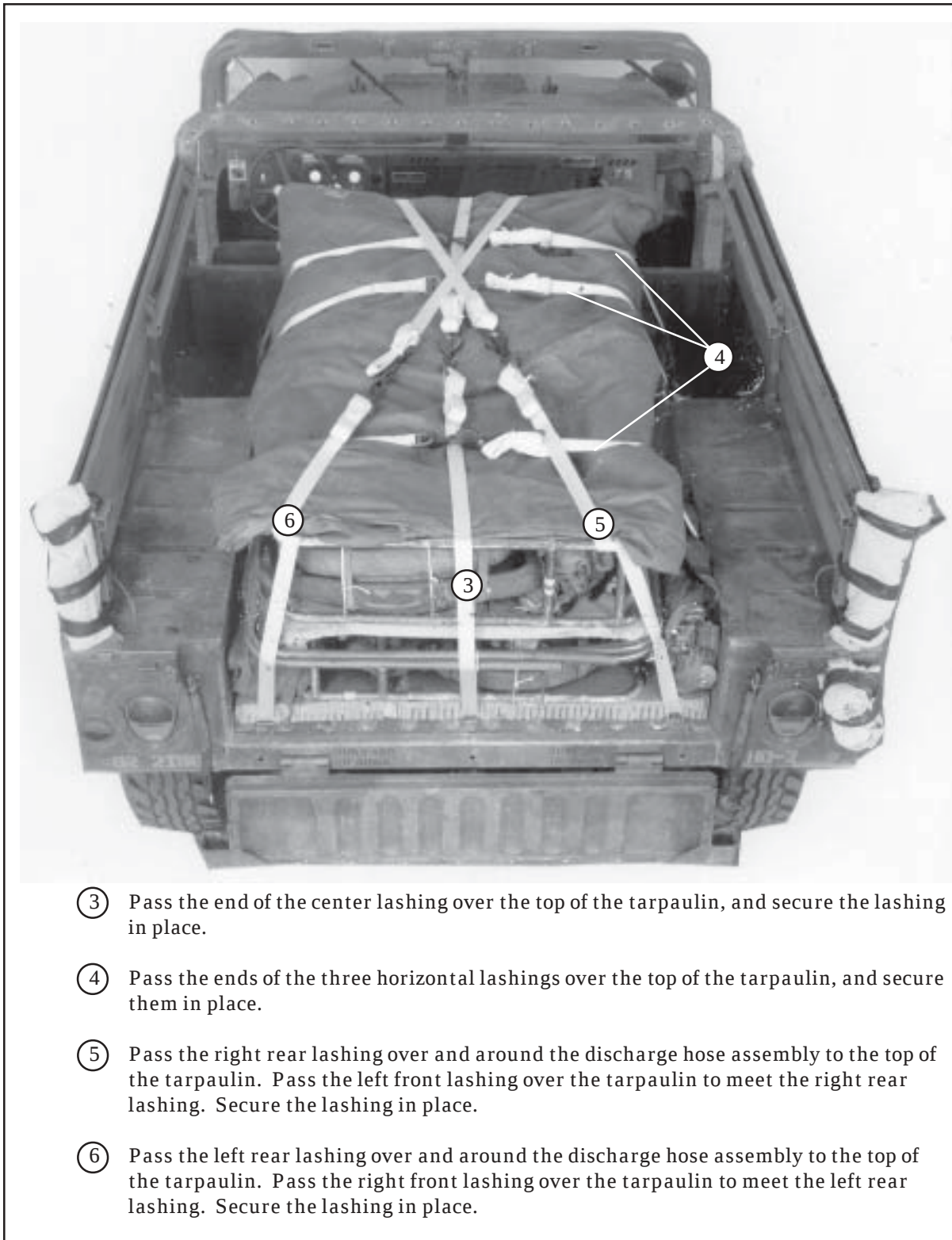
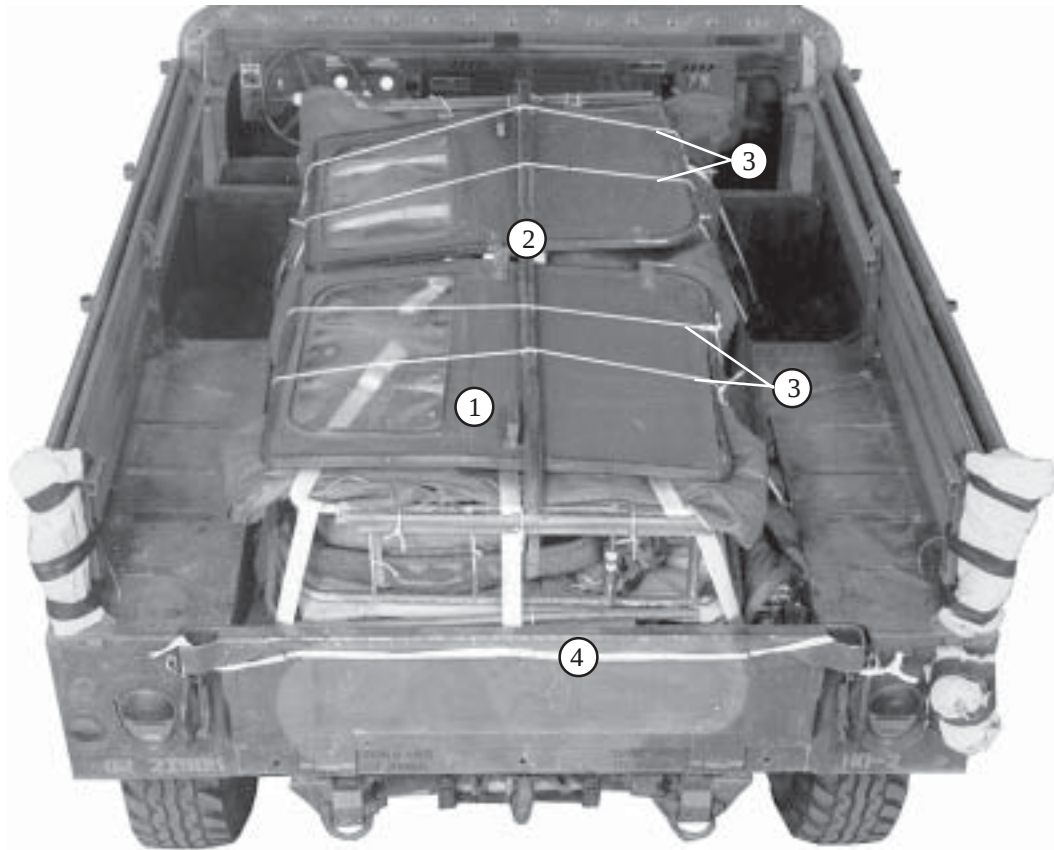


Figure 1-53. FARE Secured (continued)

SECURING ACCESSORIES

1-38. Secure the accessories on the tarpaulin as shown in Figure 1-54.



- ① Place the doors on top of the tarpaulin.
- ② Place the frame support on top of the doors.
- ③ Secure the doors to the bows using a length of type III nylon cord.
- ④ Close the tailgate and secure it in place with a double length of 1/2-inch tubular nylon webbing. Tie the ends using alternating half hitches and an overhand knot in the ends.

Figure 1-54. Accessories Secured

**Table 1-4. Equipment Required for Rigging FARE in an M998, 1 1/4-Ton Truck
Low-Velocity Airdrop**

National Stock Number	Item	Quantity
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
8135-00-664-6958	Cushioning material, packaging, cellulose	As required
1670-00-753-3928	Pad, energy-dissipating (honeycomb) 3- by 36- by 96-in	4 sheets
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00268-2411	Tie-down assembly, 15-ft	6
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Type VIII	As required

SECTION IV - RIGGING FARE WITH SEVEN 500-GALLON FUEL DRUMS ON A 32-FOOT PLATFORM

DESCRIPTION OF LOAD

1-39. Two containerized FARE and seven 500-gallon collapsible fuel drums are rigged on a 32-foot platform with six G-11 cargo parachutes. Each drum is filled with 432 gallons of fuel. Each containerized FARE weighs 1,230 pounds. Each gasoline-filled 500 gallon fuel drum weighs 2,842 pounds and is approximately 53-inches in length. The total weight of the seven gasoline-filled drums and the two containerized FARE is 22,354 pounds.

- Notes:**
1. For drums filled with a liquid other than gasoline, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. This load may not be rigged using water due to load weight requirements.
 4. Do not pressurize drums with air.

PREPARING PLATFORM

1-40. Prepare a 32-foot airdrop platform using two tandem links, eight suspension brackets, and 82 tie-down clevises as shown in Figure 1-55.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

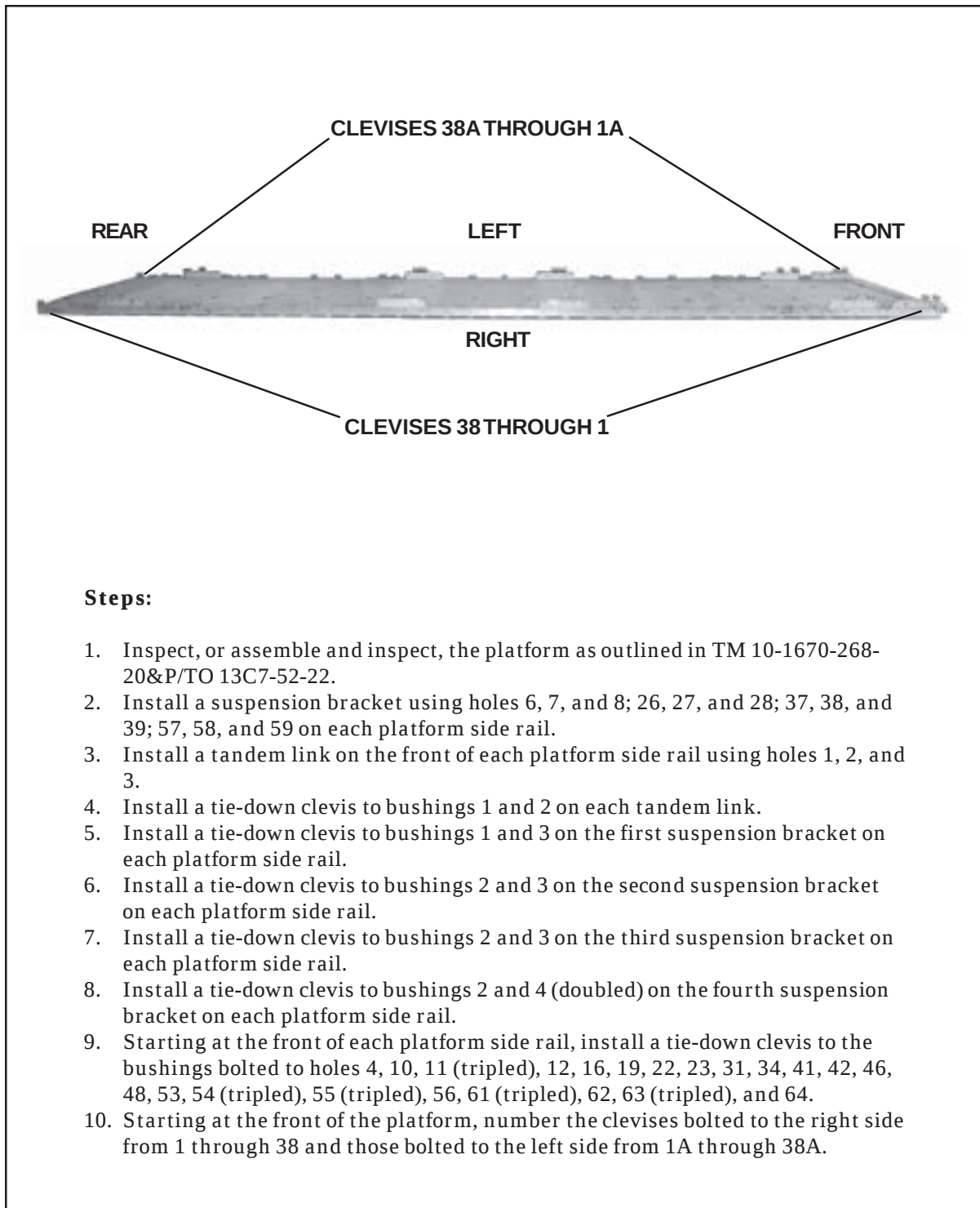


Figure 1-55. Platform Prepared

BUILDING AND POSITIONING HONEYCOMB

1-41. Position the base layers of honeycomb on the platform as shown in Figure 1-56. Build and position three honeycomb stacks on top of the base layers of honeycomb as shown in Figure 1-57.

Note: Do not glue the stacks of honeycomb to the platform.

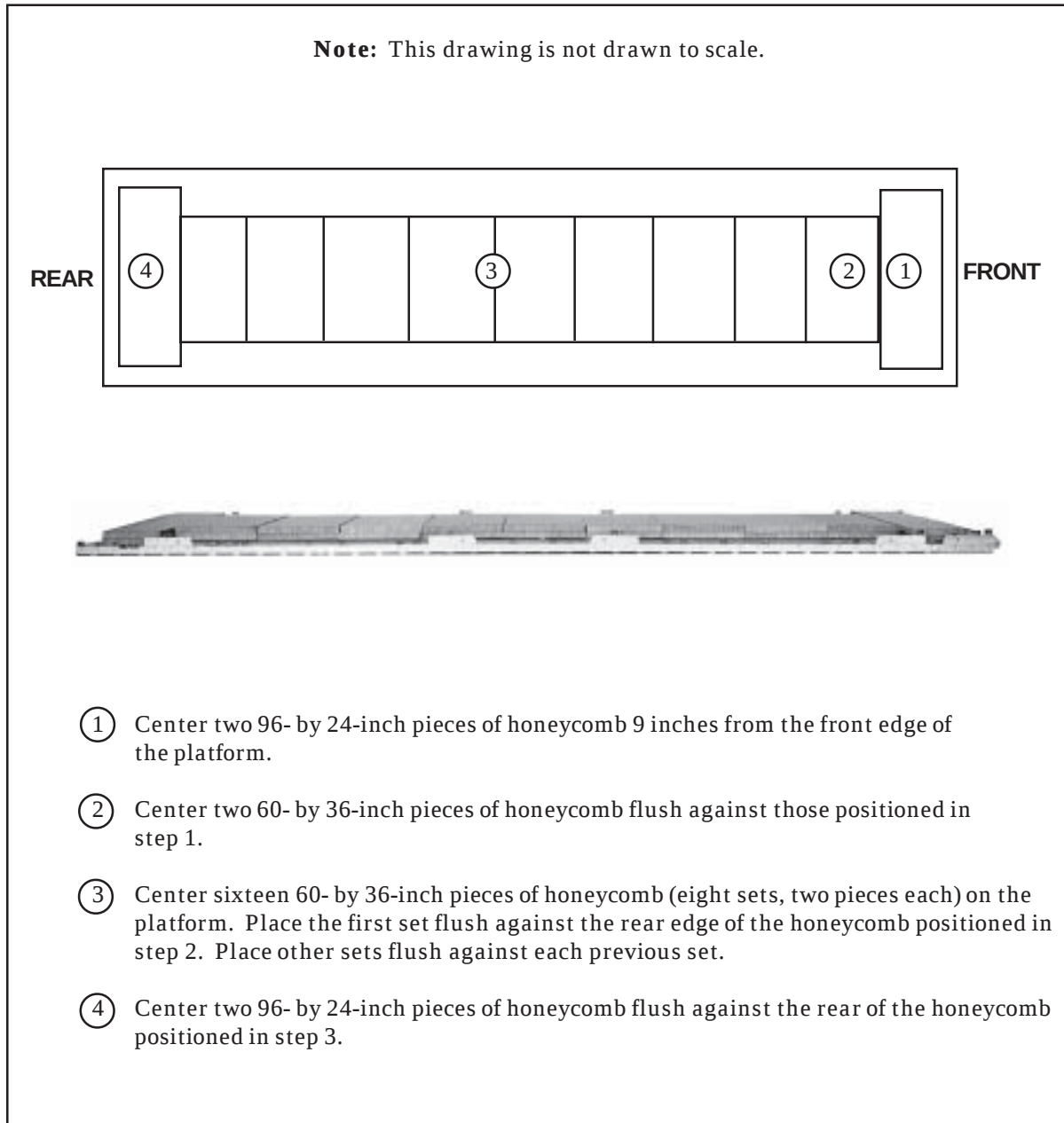
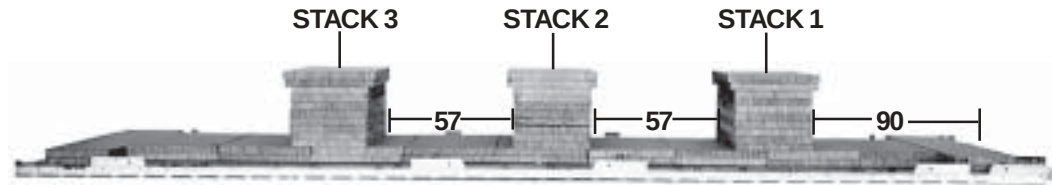


Figure 1-56. Base Layers Positioned

Note: All measurements are given in inches.



Stack Number	Pieces	Width (Inches)	Length (Inches)	Material	Instructions
1	8	60	30	Honeycomb	Center and glue on top of base layers 90 inches from the front edge of the platform.
	1	60	34	Honeycomb	Center and glue on top of the base.
	1	60	36	Honeycomb	Center and glue on top of the 60- by 34-inch piece of honeycomb.
2	8	60	30	Honeycomb	Build stack according to stack 1.
	1	60	34	Honeycomb	Center stack 57 inches from the rear edge of stack 1.
	1	60	36	Honeycomb	
3	8	60	30	Honeycomb	Build stack according to stack 1.
	1	60	34	Honeycomb	Center stack 57 inches from the rear edge of stack 2.
	1	60	36	Honeycomb	

Figure 1-57. Honeycomb Stacks Prepared and Positioned

POSITIONING AND LASHING DRUMS

1-42. Before lifting, check each fuel drum and fittings for leaks and damage. Be sure each end of each fuel drum has two lifting shackles. Attach a 9-foot (2-loop), type XXVI nylon webbing sling to the fuel drum lifting shackle by adapting the procedures in paragraph 1-8 and as shown in Figure 1-16. Position the fuel drums as shown in Figure 1-58.

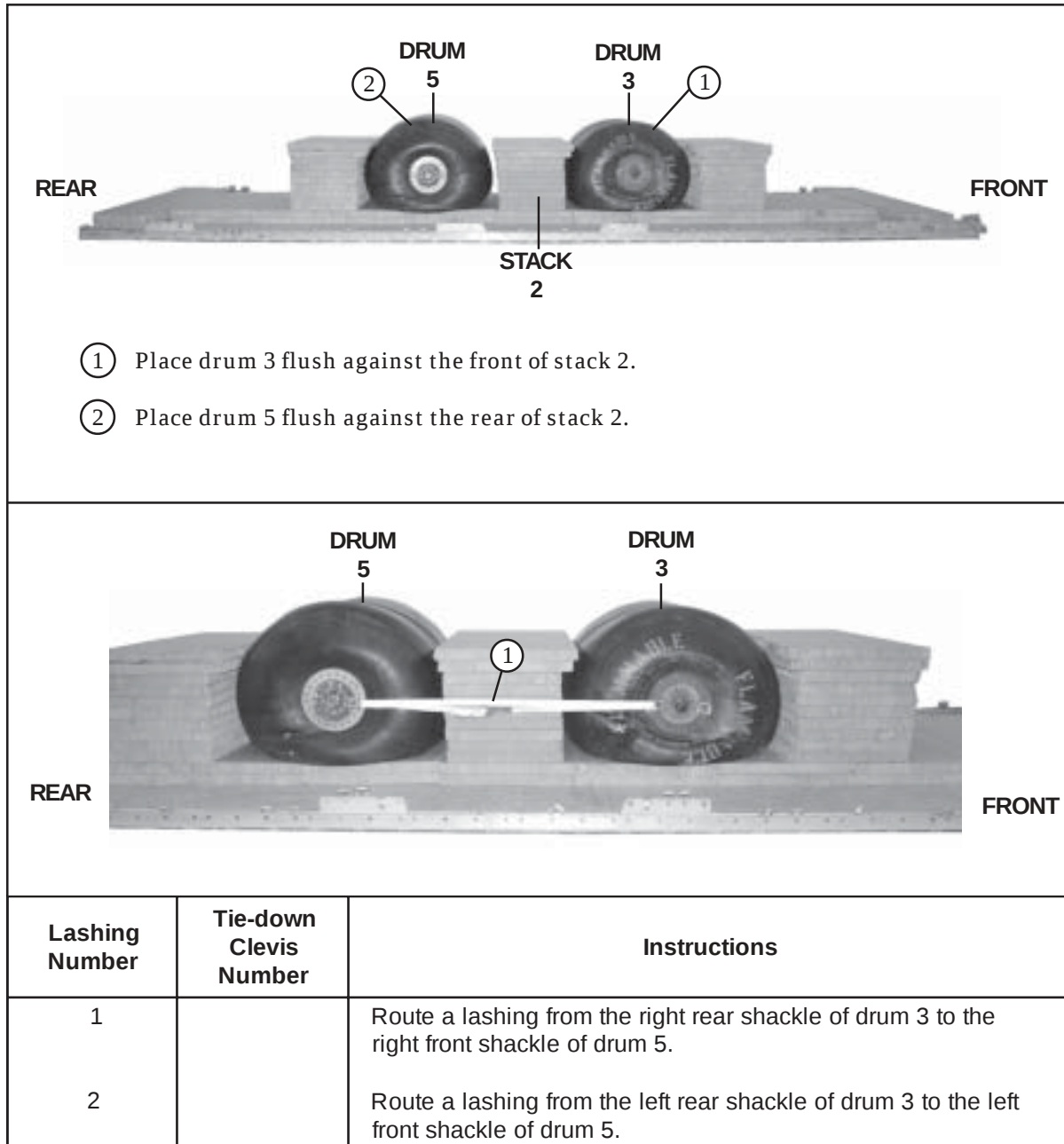


Figure 1-58. Fuel Drums Positioned and Lashed

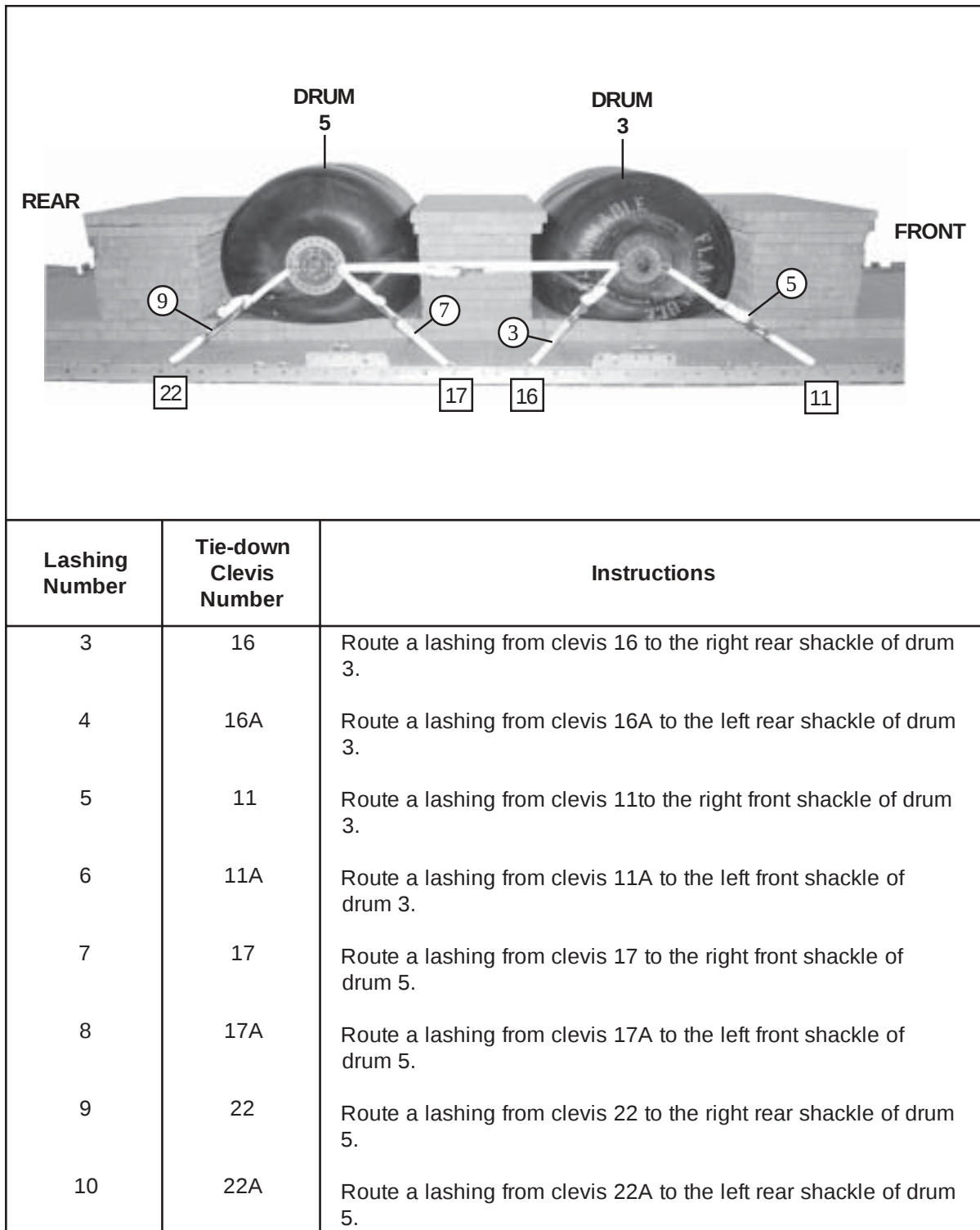


Figure 1-58. Fuel Drums Positioned and Lashed (Continued)

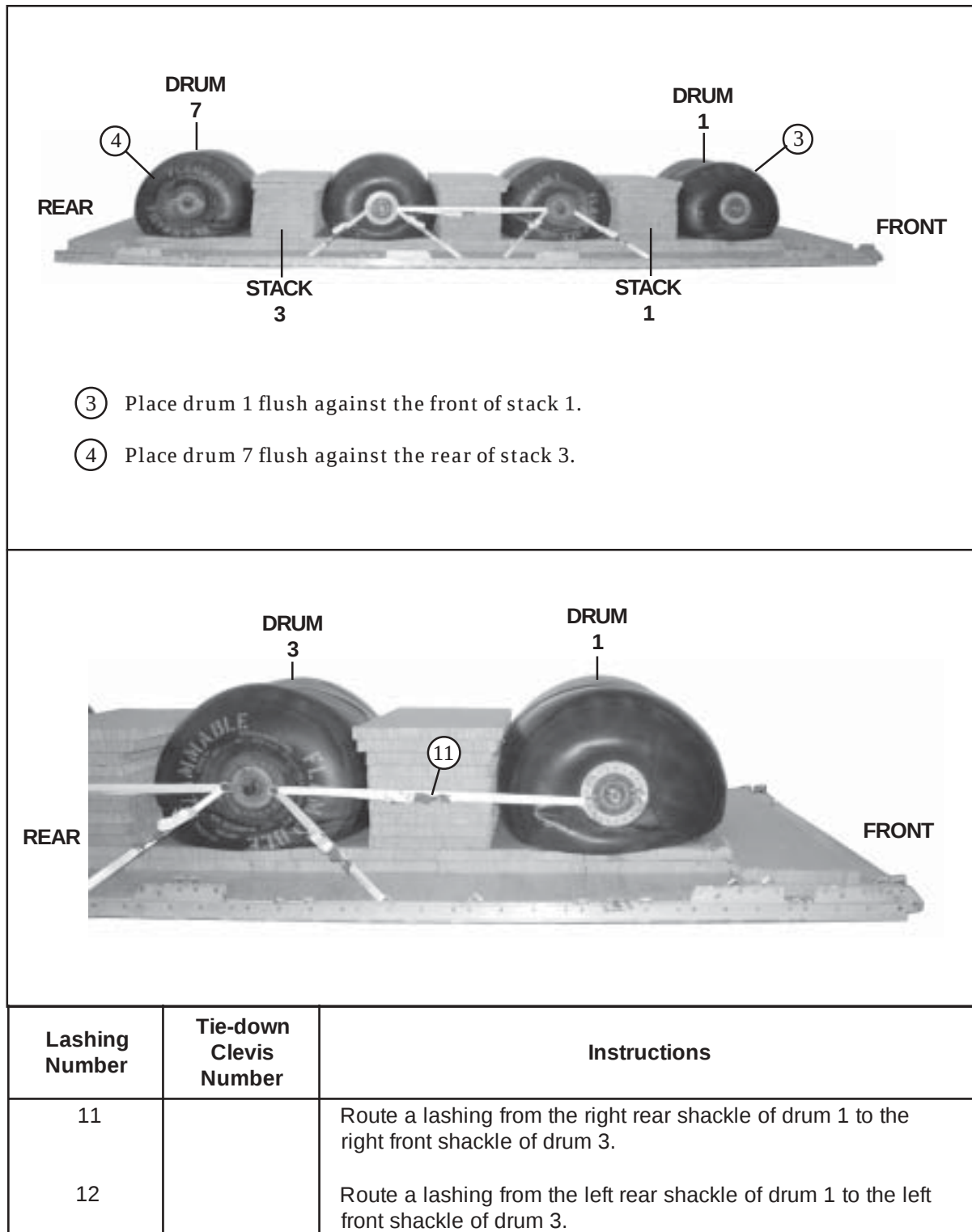


Figure 1-58. Fuel Drums Positioned and Lashed (Continued)

Lashing Number	Tie-down Clevis Number	Instructions
13	10	Route a lashing from clevis 10 to the right rear shackle of drum 1.
14	10A	Route a lashing from clevis 10A to the left rear shackle of drum 1.
15	4	Route a lashing from clevis 4 to the right front shackle of drum 1.
16	4A	Route a lashing from clevis 4A to the left front shackle of drum 1.

Lashing Number	Tie-down Clevis Number	Instructions
17		Route a lashing from the right rear shackle of drum 5 to the right front shackle of drum 7.
18		Route a lashing from the left rear shackle of drum 5 to the left front shackle of drum 7.

Figure 1-58. Fuel Drums Positioned and Lashed (Continued)

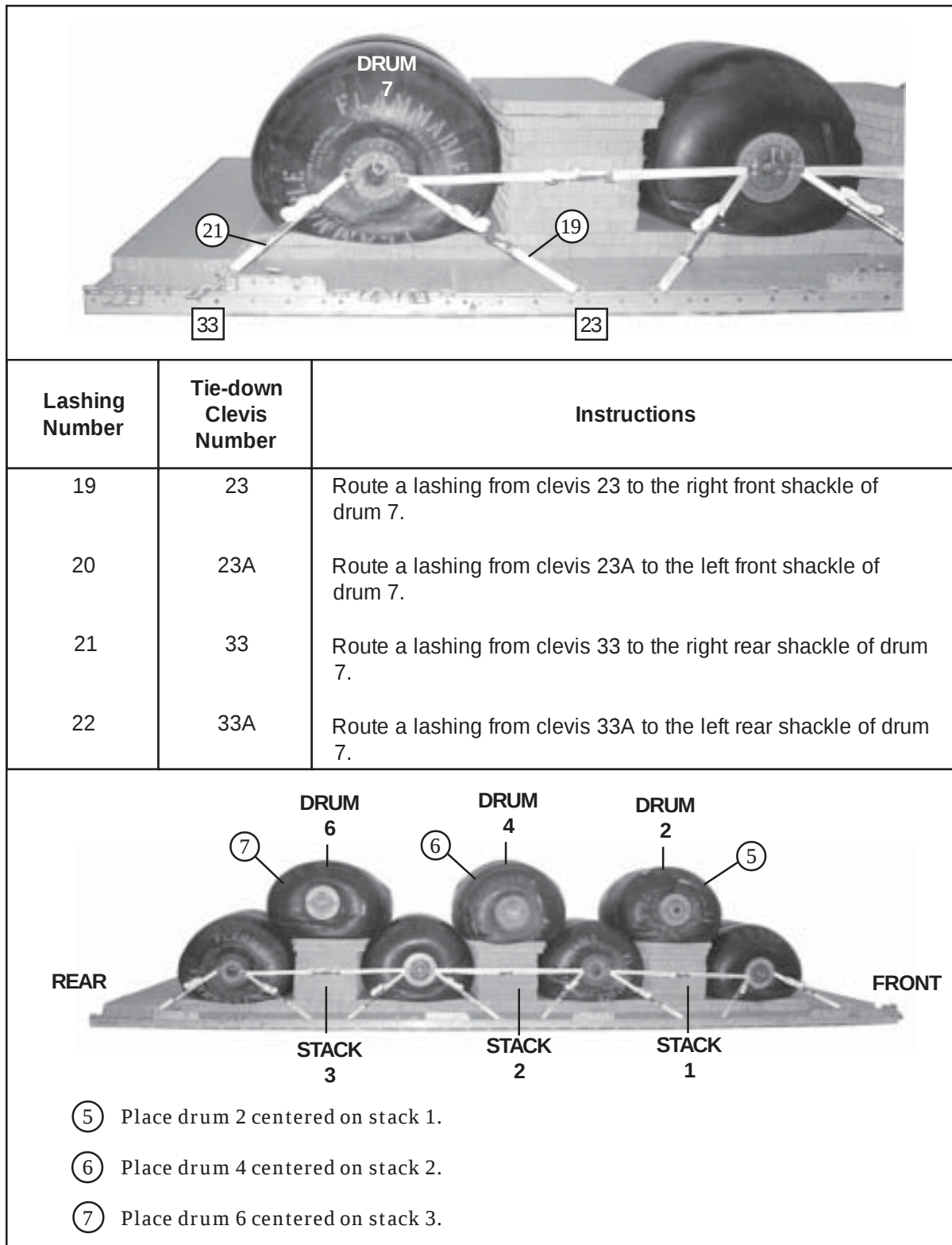


Figure 1-58. Fuel Drums Positioned and Lashed (Continued)

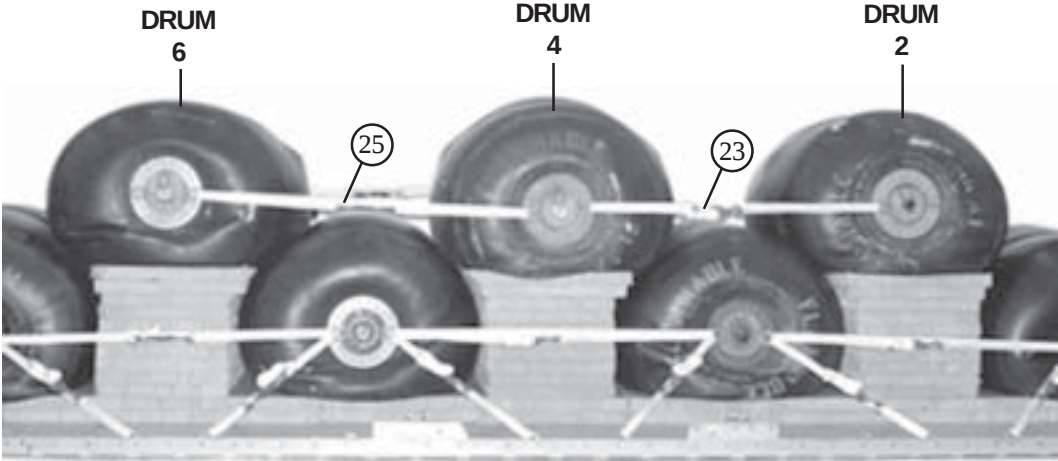
		
Lashing Number	Tie-down Clevis Number	Instructions
23		Route a lashing from the right rear shackle of drum 2 to the right front front shackle of drum 4.
24		Route a lashing from the left rear shackle of drum 2 to the left front front shackle of drum 4.
25		Route a lashing from the right rear shackle of drum 4 to the right front front shackle of drum 6.
26		Route a lashing from the left rear shackle of drum 4 to the left front front shackle of drum 6.

Figure 1-58. Fuel Drums Positioned and Lashed (Continued)

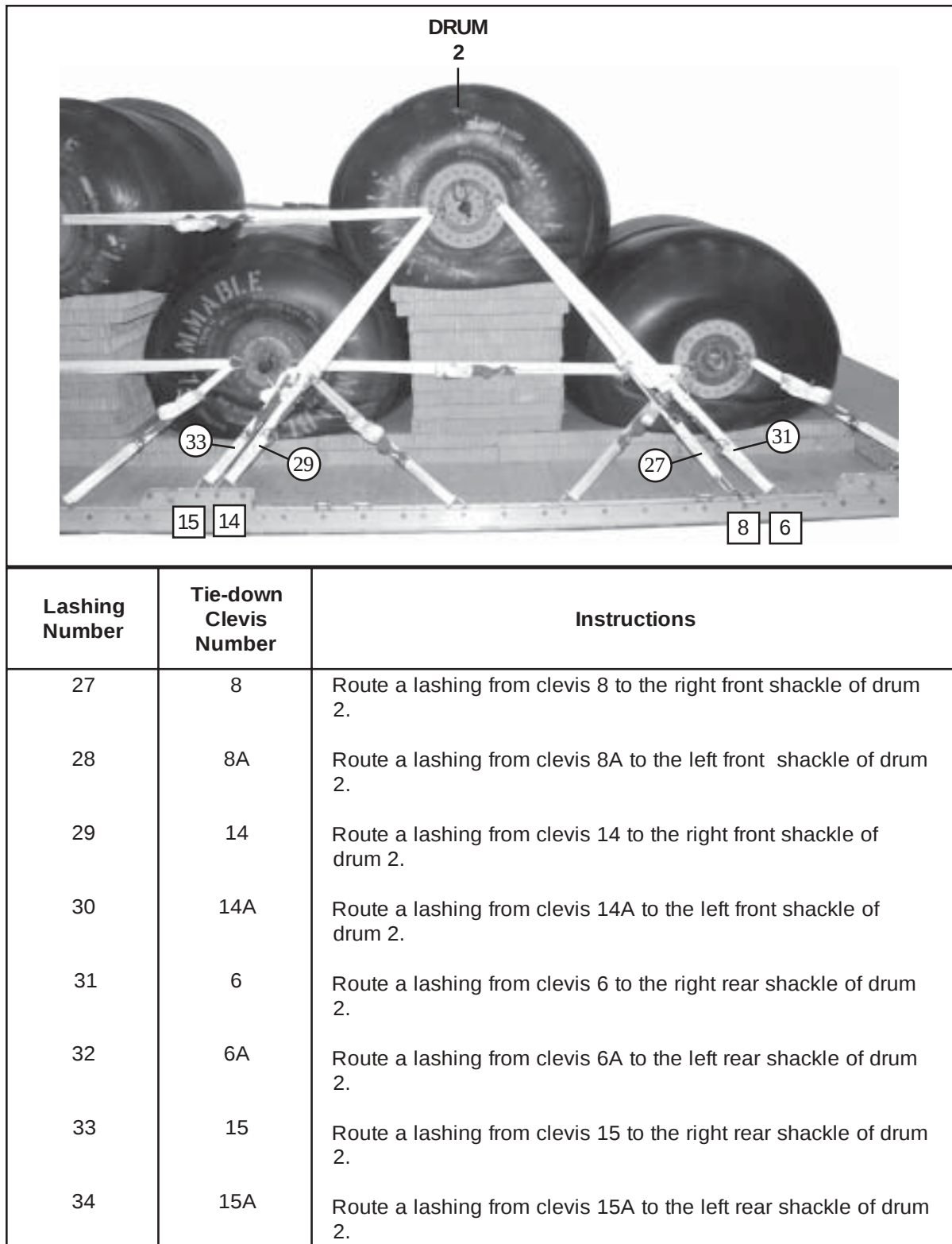


Figure 1-58. Fuel Drums Positioned and Lashed (Continued)

Lashing Number	Tie-down Clevis Number	Instructions
35	13	Route a lashing from clevis 13 to the right front shackle of drum 4.
36	13A	Route a lashing from clevis 13A to the left front shackle of drum 4.
37	20	Route a lashing from clevis 20 to the right front shackle of drum 4.
38	20A	Route a lashing from clevis 20A to the left front shackle of drum 4.
39	12	Route a lashing from clevis 12 to the right rear shackle of drum 4.
40	12A	Route a lashing from clevis 12 to the left rear shackle of drum 4.
41	21	Route a lashing from clevis 21 to the right rear shackle of drum 4.
42	21A	Route a lashing from clevis 21A to the left rear shackle of drum 4.

Figure 1-58. Fuel Drums Positioned and Lashed (Continued)

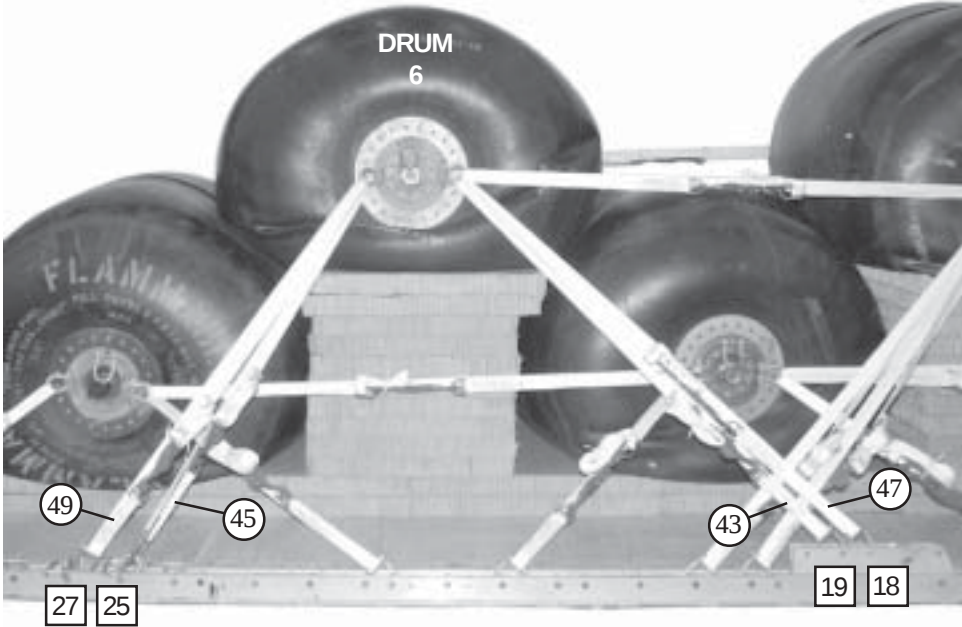
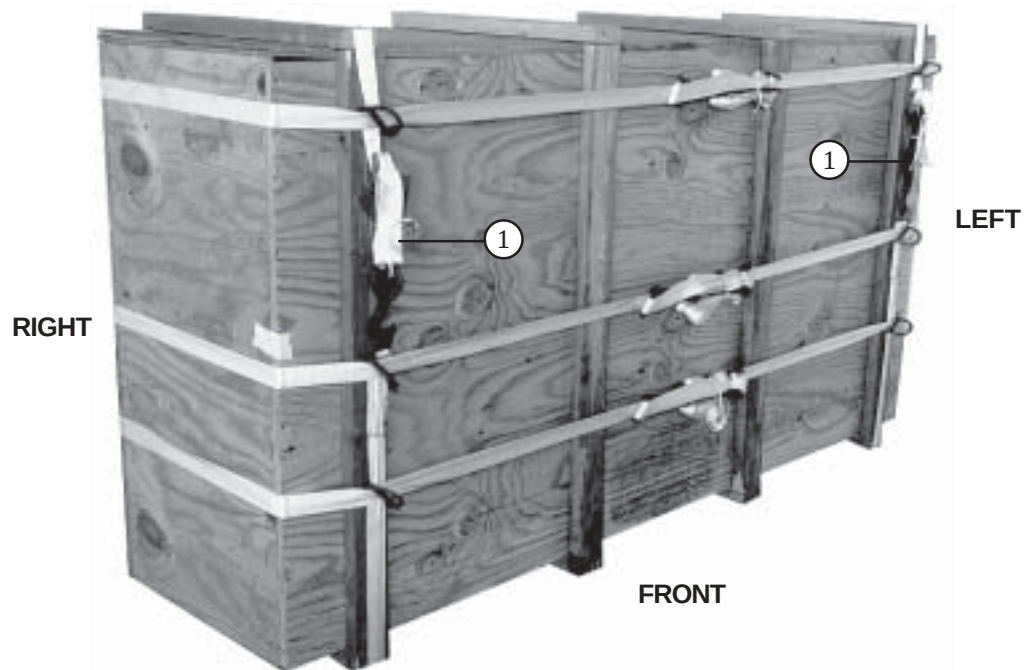
		
Lashing Number	Tie-down Clevis Number	Instructions
43	19	Route a lashing from clevis 19 to the right front shackle of drum 6.
44	19A	Route a lashing from clevis 19A to the left front shackle of drum 6.
45	25	Route a lashing from clevis 25 to the right front shackle of drum 6.
46	25A	Route a lashing from clevis 25A to the left front shackle of drum 6.
47	18	Route a lashing from clevis 18 to the right rear shackle of drum 6.
48	18A	Route a lashing from clevis 18A to the left rear shackle of drum 6.
49	27	Route a lashing from clevis 27 to the right rear shackle of drum 6.
50	27A	Route a lashing from clevis 27A to the left rear shackle of drum 6.

Figure 1-58. Fuel Drums Positioned and Lashed (Continued)

PREPARING FARE

1-43. Build two containers for the FARE according to paragraph 1-4. Prepare the components of the FARE and stow them in the containers according to paragraph 1-5. Secure the container as shown in Figure 1-59.



- ① Secure the container according to paragraph 1-6 except position the vertical lashings so that the load binders are on the front side of the container of the front container and on the rear side of the rear container.

Figure 1-59. Container Secured

INSTALLING LIFTING SLINGS AND POSITIONING FARE CONTAINERS

1-44. Install lifting slings to the FARE containers as shown in Figure 1-14.
Position the FARE container as shown in Figure 1-60.

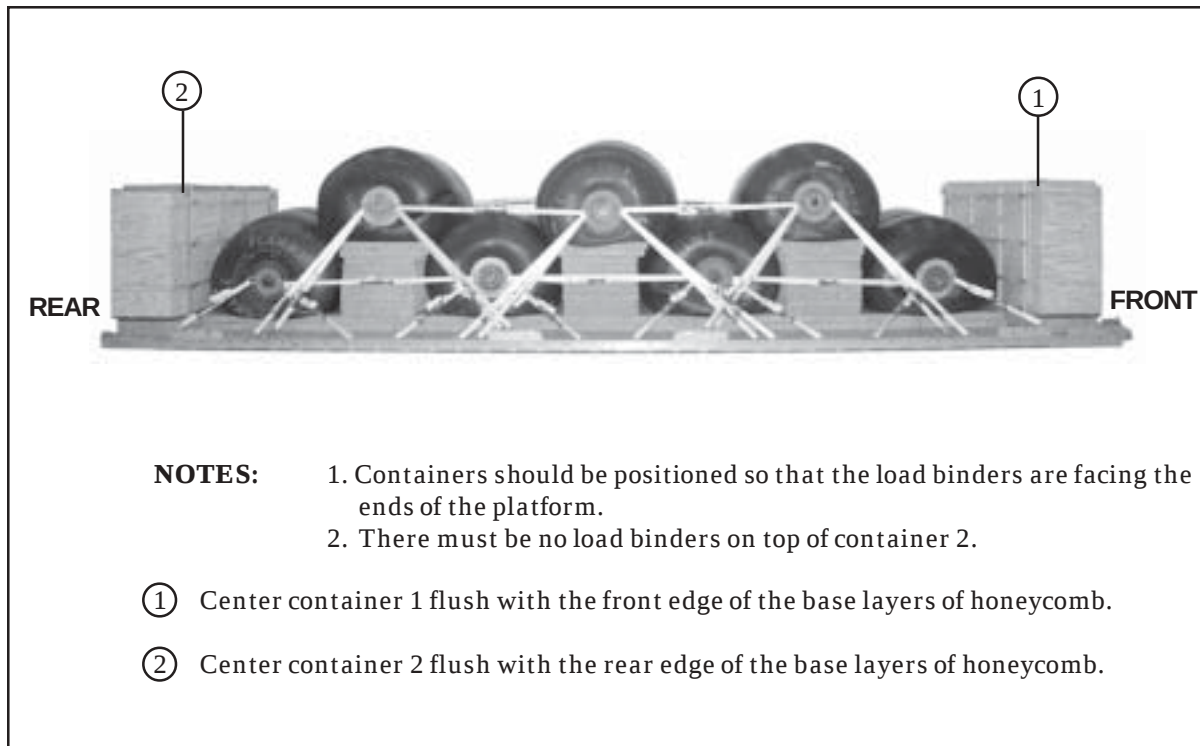


Figure 1-60. FARE Containers Positioned

LASHING FARE CONTAINERS TO PLATFORM

1-45. Lash the FARE containers to the platform as shown in Figure 1-61.

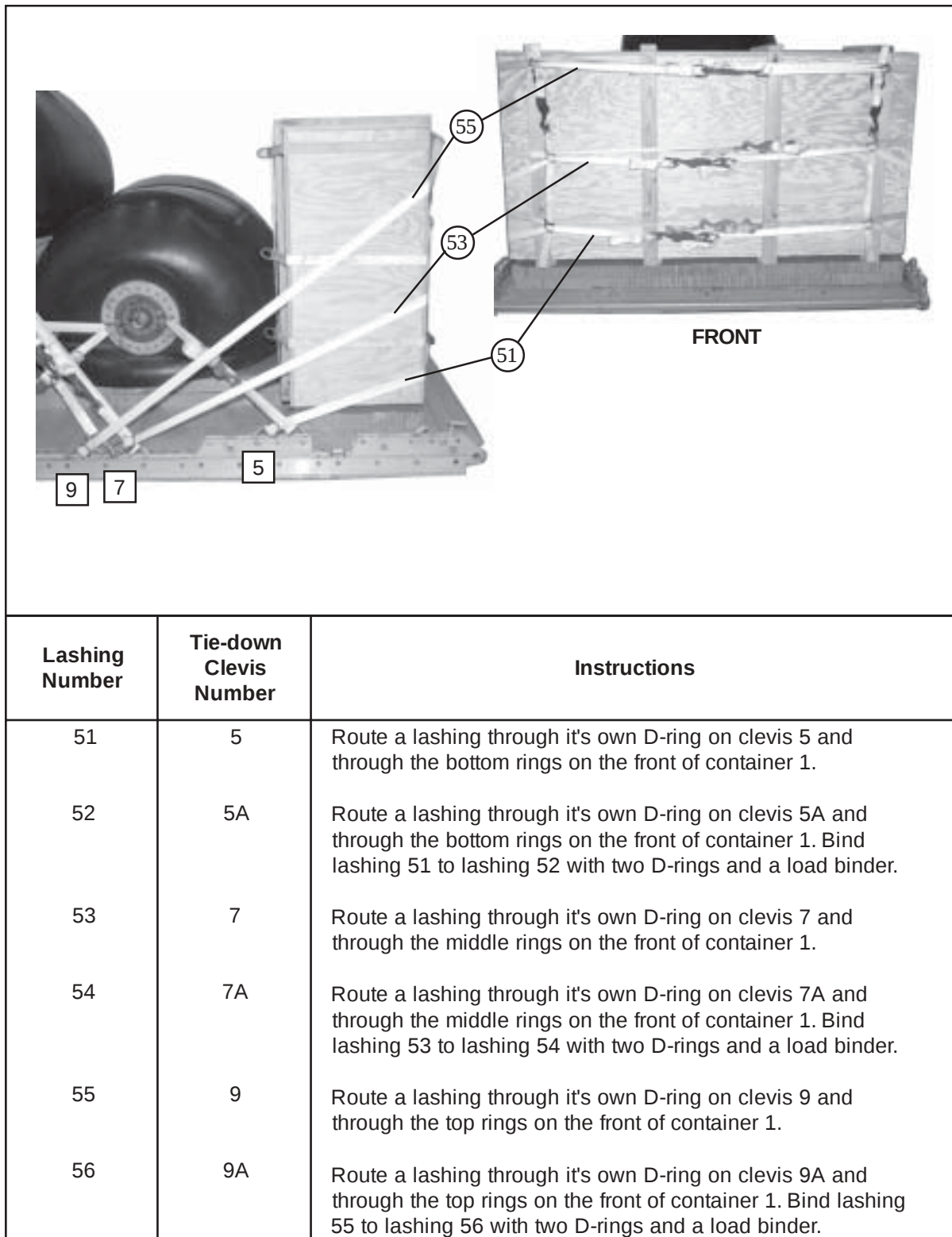


Figure 1-61. FARE Containers Lashed

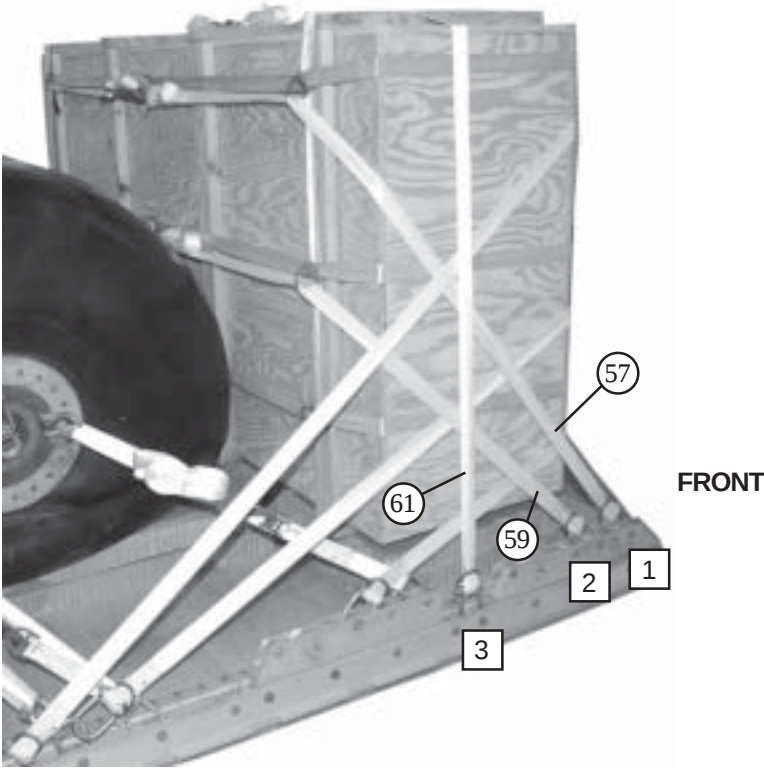
		
Lashing Number	Tie-down Clevis Number	Instructions
57	1	Route a lashing through it's own D-ring on clevis 1 and through the top rings on the rear of container 1.
58	1A	Route a lashing through it's own D-ring on clevis 1A and through the top rings on the rear of container 1. Bind lashing 57 to lashing 58 with two D-rings and a load binder.
59	2	Route a lashing through it's own D-ring on clevis 2 and through the middle rings on the rear of container 1.
60	2A	Route a lashing through it's own D-ring on clevis 2A and through the middle rings on the rear of container 1. Bind lashing 59 to lashing 60 with two D-rings and a load binder.
61	3	Route a lashing through it's own D-ring on clevis 3 and over the top of container 1.
62	3A	Route a lashing through it's own D-ring on clevis 3A and over the top of container 1. Bind lashing 61 to lashing 62 with two D-rings and a load binder.

Figure 1-61. FARE Containers Lashed (Continued)

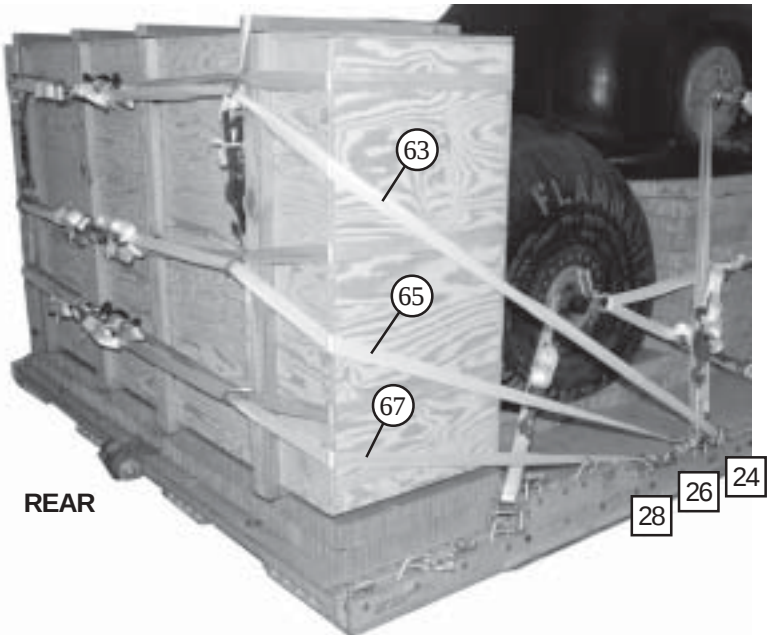
		
Lashing Number	Tie-down Clevis Number	Instructions
63	24	Route a lashing through it's own D-ring on clevis 24 and through the top rings on the rear of container 2.
64	24A	Route a lashing through it's own D-ring on clevis 24A and through the top rings on the rear of container 2. Bind lashing 63 to lashing 64 with two D-rings and a load binder.
65	26	Route a lashing through it's own D-ring on clevis 26 and through the middle rings on the rear of container 2.
66	26A	Route a lashing through it's own D-ring on clevis 26A and through the middle rings on the rear of container 2. Bind lashing 65 to lashing 66 with two D-rings and a load binder.
67	28	Route a lashing through it's own D-ring on clevis 28 and through the bottom rings on the rear of container 2.
68	28A	Route a lashing through it's own D-ring on clevis 28A and through the bottom rings on the rear of container 2. Bind lashing 67 to lashing 68 with two D-rings and a load binder.

Figure 1-61. FARE Containers Lashed (Continued)

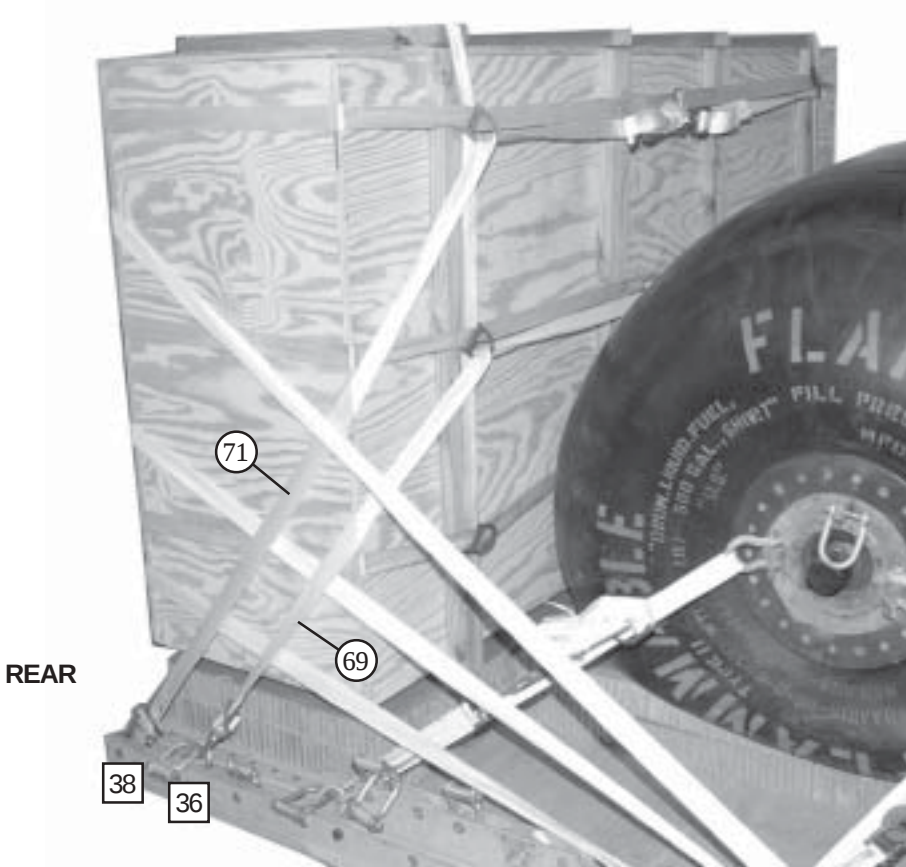
		
Lashing Number	Tie-down Clevis Number	Instructions
69	36	Route a lashing through it's own D-ring on clevis 36 and through the middle rings on the front of container 2.
70	36A	Route a lashing through it's own D-ring on clevis 36A and through the middle rings on the front of container 2. Bind lashing 69 to lashing 70 with two D-rings and a load binder.
71	38	Route a lashing through it's own D-ring on clevis 38 and through the top rings on the front of container 2.
72	38A	Route a lashing through it's own D-ring on clevis 38A and through the top rings on the front of container 2. Bind lashing 65 to lashing 66 with two D-rings and a load binder.

Figure 1-61. FARE Containers Lashed (Continued)

INSTALLING SUSPENSION SLINGS

1-46. Install suspension slings as shown in Figure 1-62.

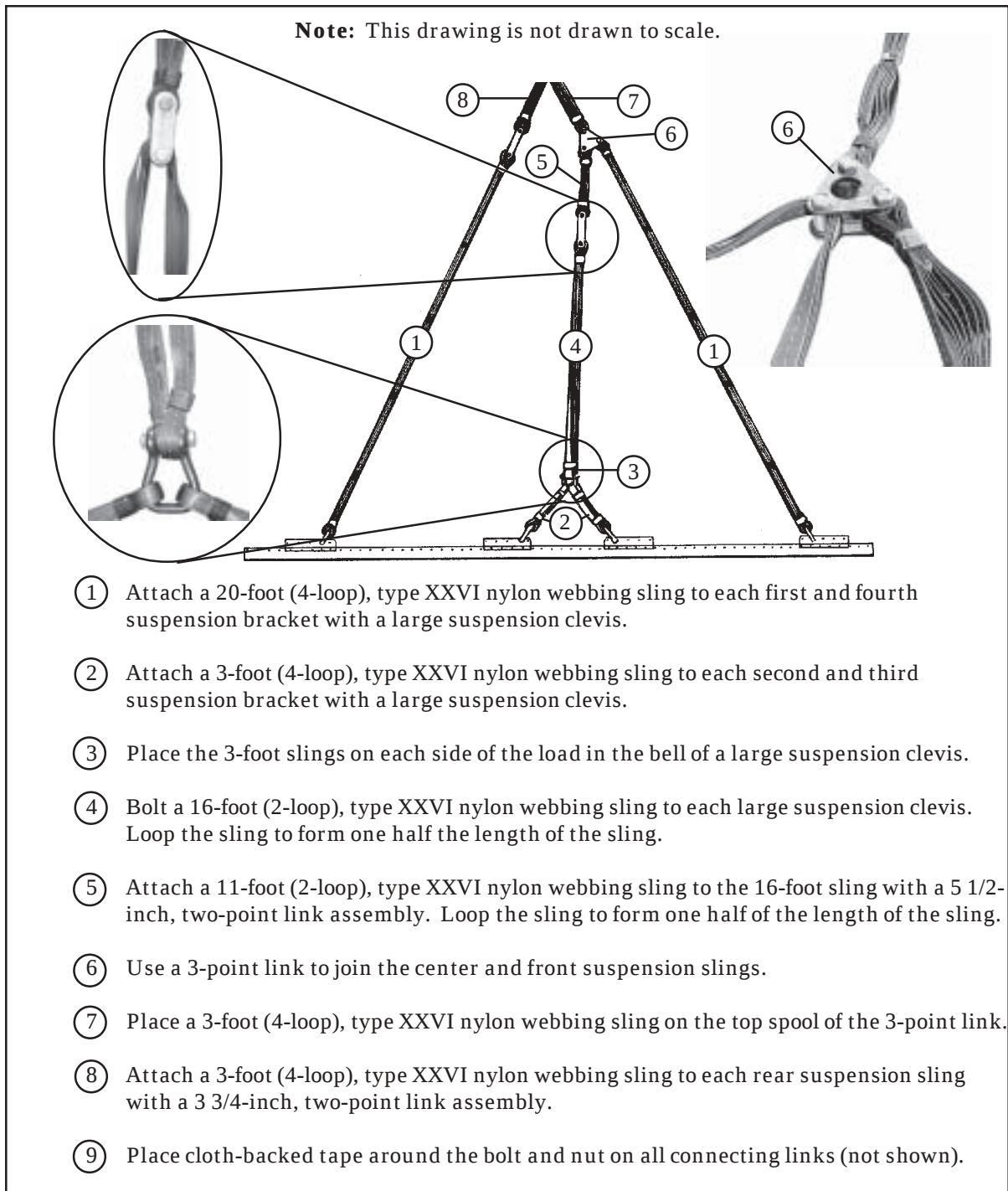
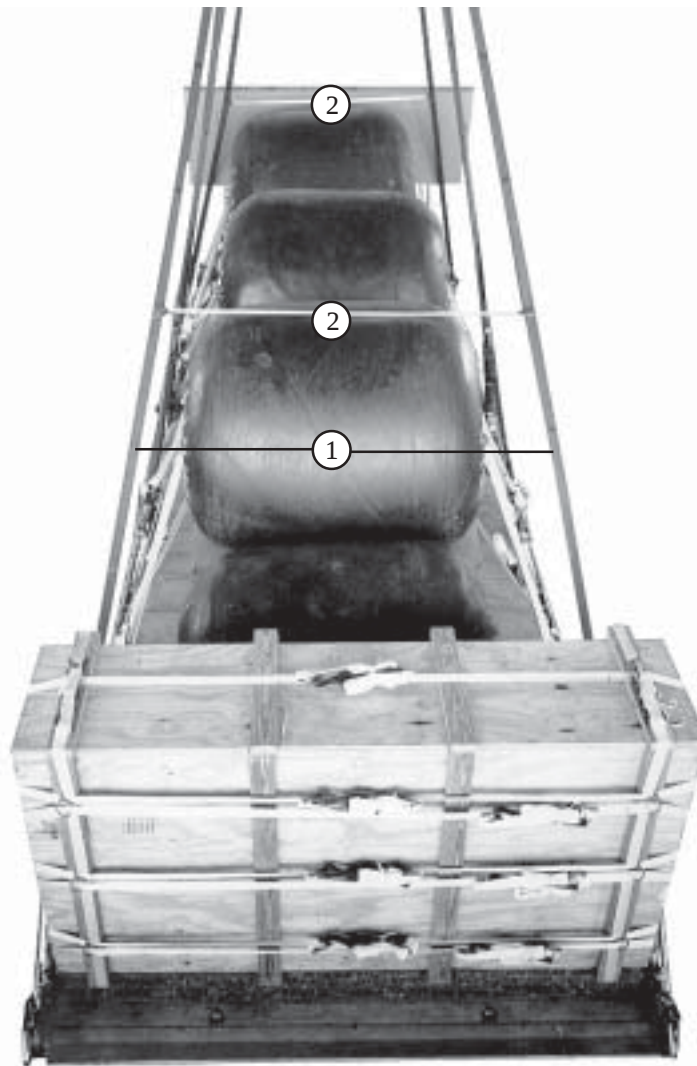


Figure 1-62. Suspension Slings Installed

SAFETY TIEING SUSPENSION SLINGS

1-47. Safety tie the suspension slings as shown in Figure 1-63. Refer to the Notice of Exception in the Introduction portion of this manual.



- ① Raise the suspension slings.
- ② Raise the suspension slings and install the suspension sling safety ties as shown in Appendix A, to the front and rear suspension slings, even with the top of drum 2 and drum 6.

Figure 1-63. Suspension Slings Safety Tied

BUILDING AND INSTALLING CARGO PARACHUTE STOWAGE TRAY

1-48. Build the cargo parachute stowage tray as shown in Figure 1-64. Install the cargo parachute stowage tray as shown in Figure 1-65.

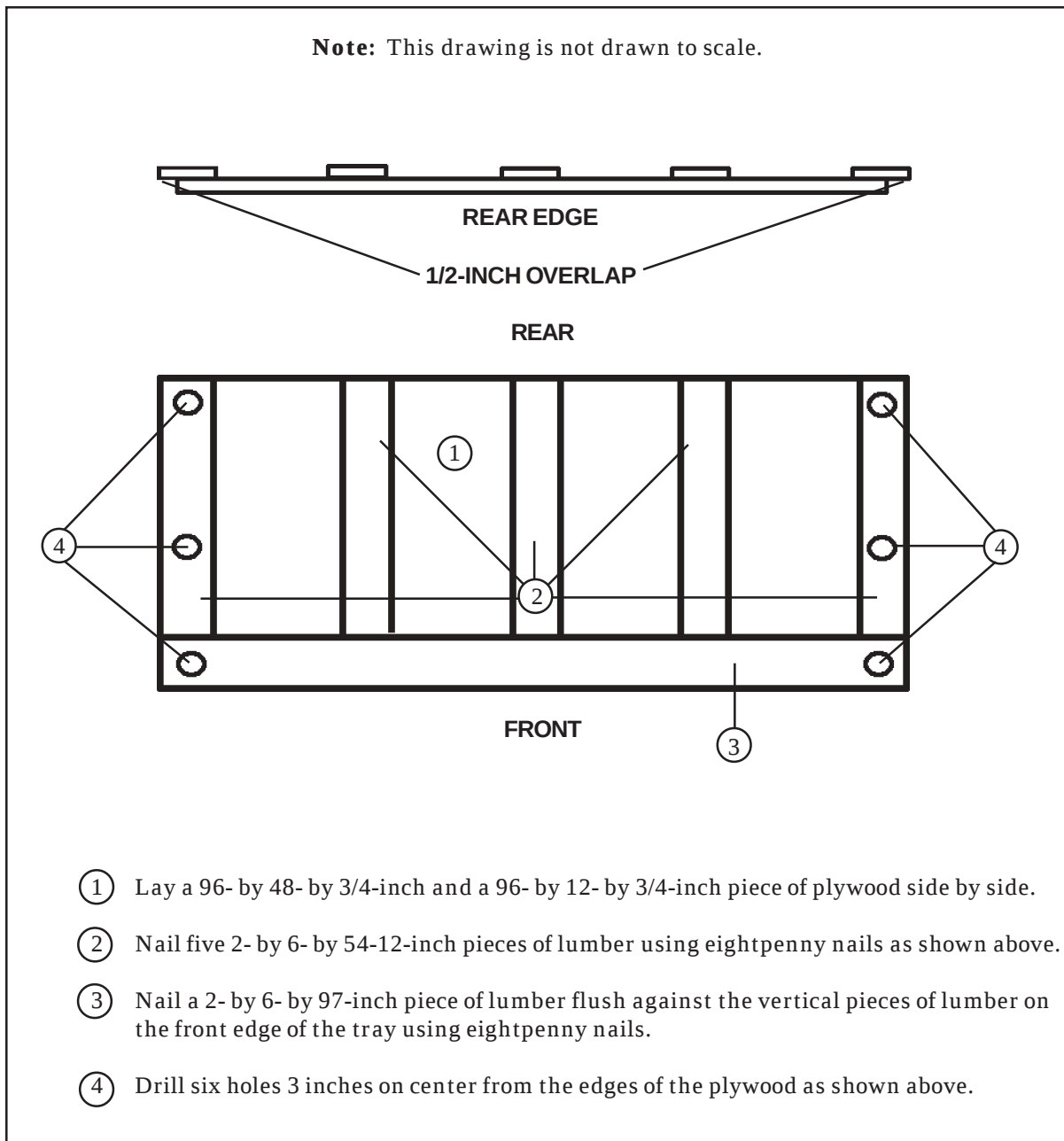


Figure 1-64. Cargo Parachute Stowage Tray Built

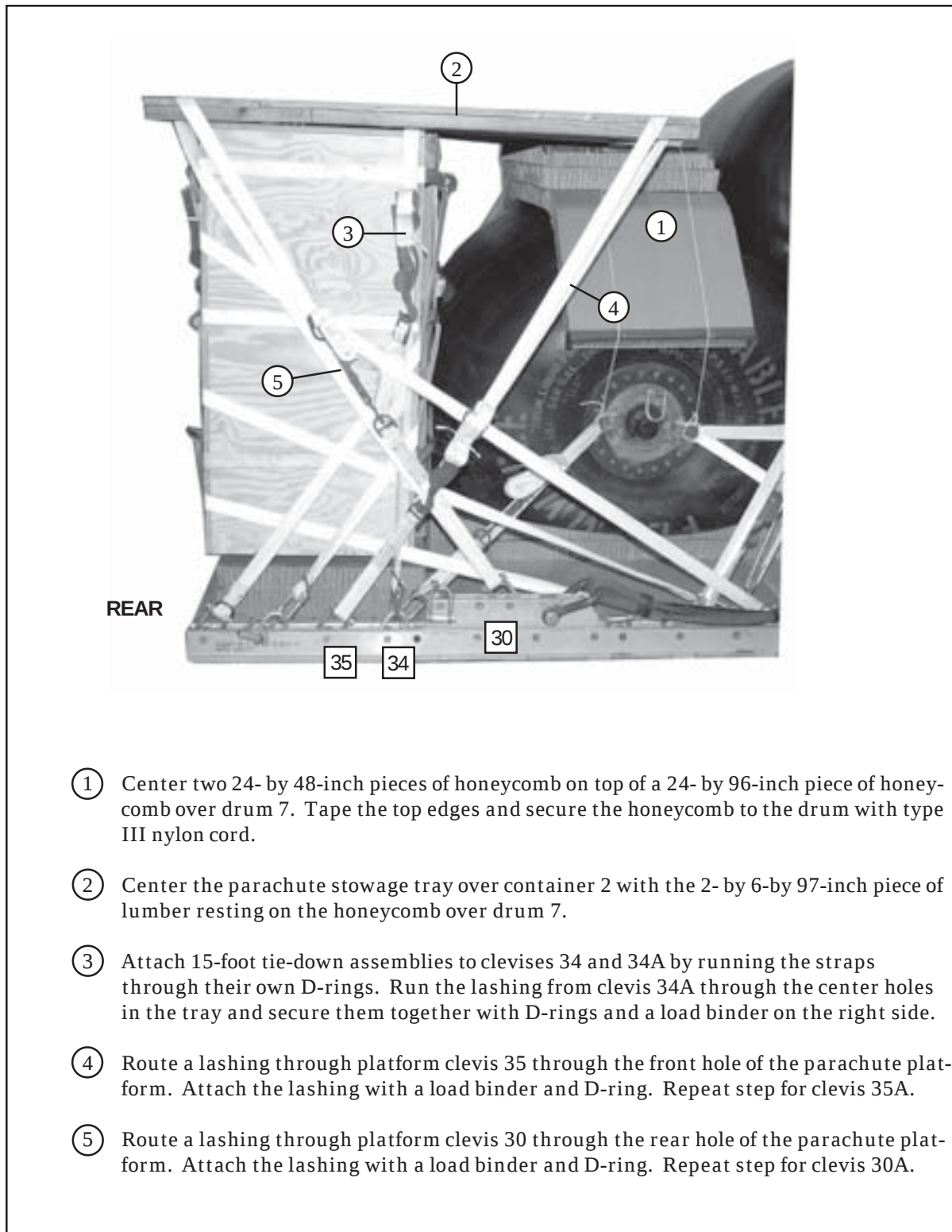


Figure 1-65. Cargo Parachute Stowage Tray Installed

PREPARING AND STOWING CARGO PARACHUTES

1-49. Prepare, place, and restrain six G-11 cargo parachutes according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-66.

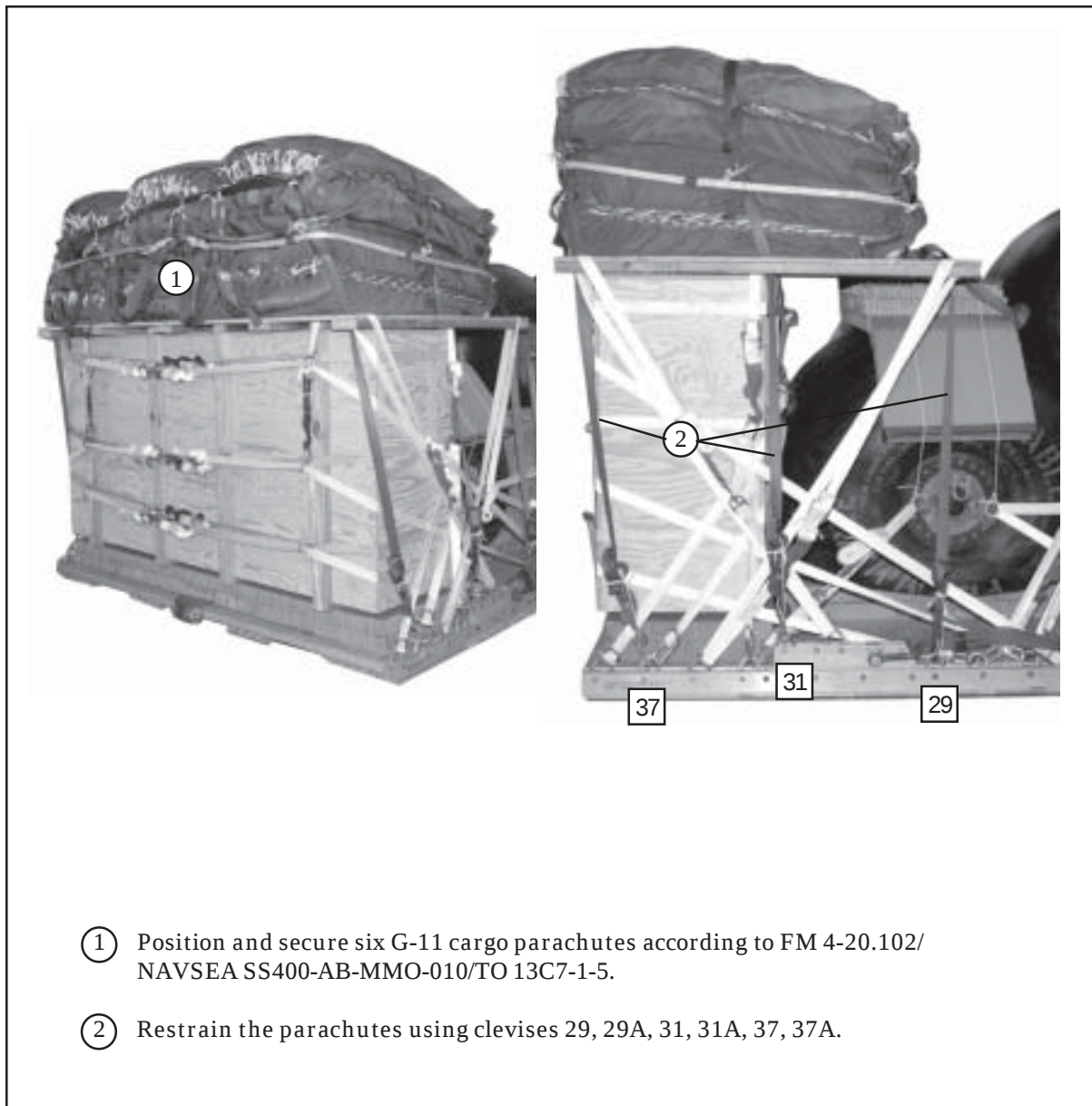
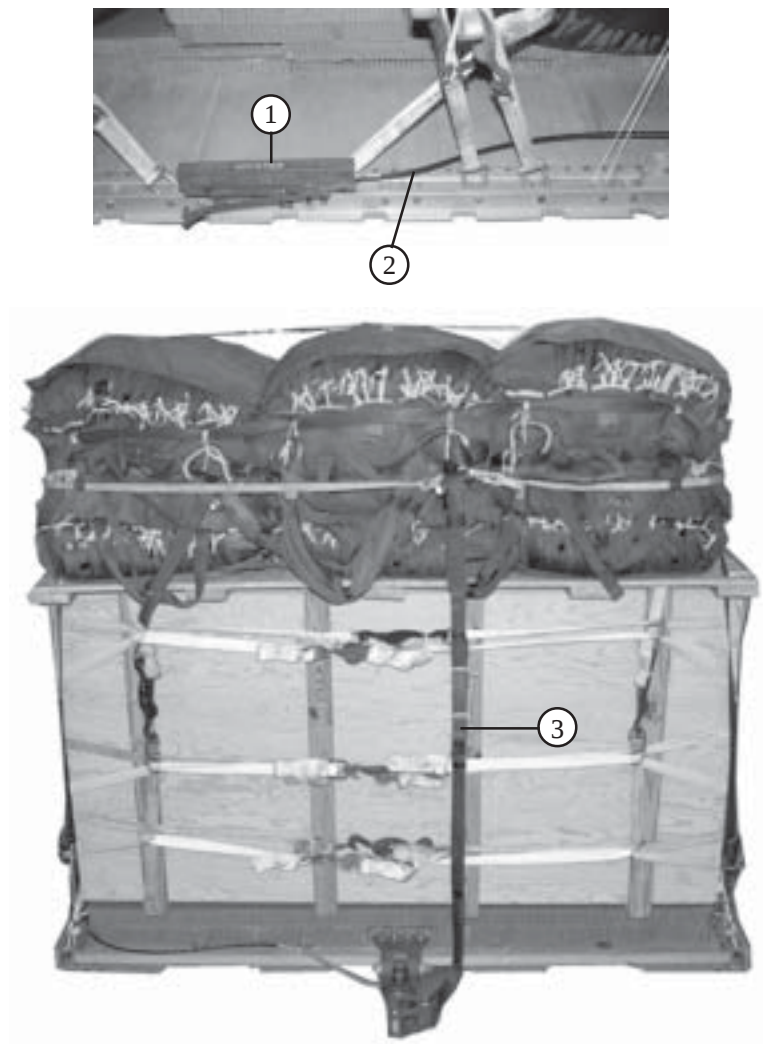


Figure 1-66. Cargo Parachute Stowed

INSTALLING THE EXTRACTION SYSTEM

1-50. Install the EFTC as shown in Figure 1-67.



- ① Install the mounting brackets of the EFTC to the rear holes on the left platform side rails according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
- ② Install a 28-foot cable to the actuator assembly. S-fold the cable to take up the slack according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
- ③ Attach a 9-foot (2-loop), type XXVI nylon webbing sling as a deployment line.

Figure 1-67. Extraction System Installed

INSTALLING PARACHUTE RELEASE SYSTEM

1-51. Install the M-2 cargo parachute release system according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-68.

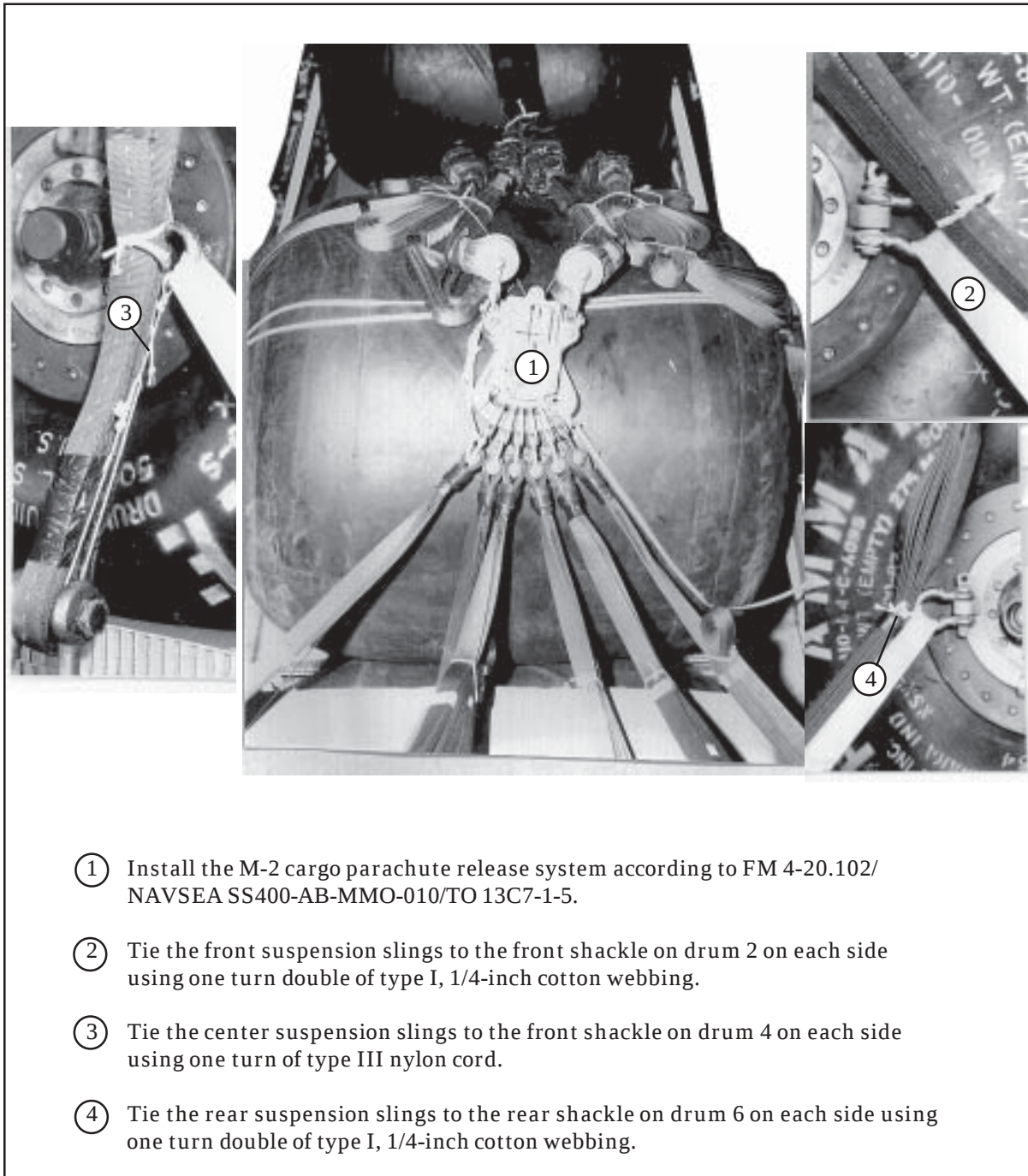


Figure 1-68. M-2 Cargo Parachute Release System Installed

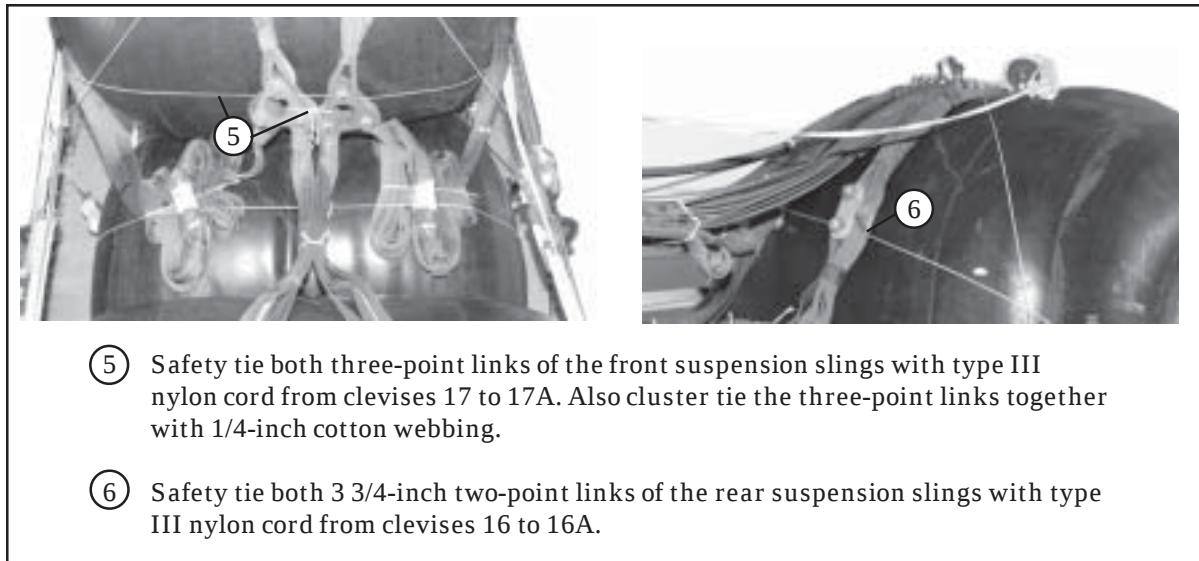


Figure 1-68. M-2 Cargo Parachute Release System Installed (Continued)

PLACING EXTRACTION PARACHUTE

1-52. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

1-53. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

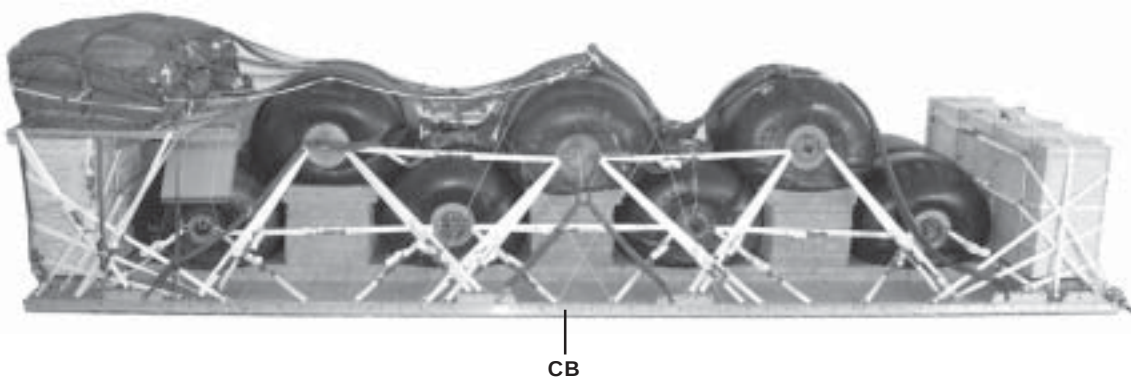
1-54. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 1-69. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

1-55. Use the equipment list in Table 1-5 to rig the load shown in Figure 1-69.

CAUTION:

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.

**RIGGED LOAD DATA**

Weight	28,000 pounds
Maximum Weight	30,000 pounds
Height	95 inches
Width	108 inches
Overall Length	402 inches
Overhang: Front	0 inches
Rear (EFTC)	18 inches
Center of Balance (CB) (from front edge of platform)	202 inches
Extraction System	EFTC

Figure 1-69. FARE with Seven 500-Gallon Fuel Drums Rigged for Low-Velocity Airdrop

Table 1-5. Equipment Required for Rigging FARE with Seven 500-Gallon Fuel Drums for Low-Velocity Airdrop

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive, paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, suspension: 1-in (large)	10
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5783	Coupling, airdrop, extraction force transfer with cable, 28-ft	1
1670-00-360-0328	Cover: Clevis, large	As required
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
5365-00-937-0147	D-ring, heavy-duty, 10,000-lb	24
1670-00-003-4391	Knife, miniature, cutter (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add 2 for DES)	2
1670-01-062-6313	Line, drogue (for DES) 60-ft (3-loop), type XXVI	1
1670-01-064-4454	Line, extraction: For C-130: 60-ft (6-loop), type XXVI	1
1670-01-062-6312	For C-141: 120-ft (6-loop), type XXVI	
1670-01-062-6312	For C-5: 120-ft, (6-loop), type XXVI	
1670-01-064-4454	60-ft, (6-loop), type XXVI	1
1670-01-468-9178	For C-17: 140-ft (6-loop), type XXVI	1
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1
	Link Assembly:	
5306-00-435-8994		(8)
5310-00-232-5165	Nut, 1-in, hexagonal (add 2 for DES)	(8)
1670-00-003-1953	Plate, side, 3 3/4-in (add 2 for DES)	(4)
1670-00-003-1954	Plate, side, 5 1/2-in	(4)
5365-00-007-3414	Spacer, large (add 2 for DES)	(8)
1670-01-307-1055	Three-point	2
1670-00-006-2752	Four-point	1
5510-00-220-6146	Lumber, 2- by 4-in:	
	24-inch	8
	27-inch	8
	50 1/4-inch	16

Table 1-5. Equipment Required for Rigging FARE with Seven 500-Gallon Fuel Drums for Low-Velocity Airdrop (continued)

National Stock Number	Item	Quantity
1670-00-753-3928	Pad, energy-dissipating (honeycomb) 3- by 36- by 96-in	32 sheets
1670-01-016-7841	Parachute: Cargo: G-11C	6
1670-00-040-8135	Cargo extraction: 28-ft	2
1670-01-063-3715	Drogue (for DES) 15-ft	1
1670-01-353-8425	Platform, airdrop, type V, 32-ft: Bracket assembly, coupling	(1)
1670-01-162-2372	Clevis assembly, type V	(76)
1670-01-162-2376	Extraction bracket assembly	(1)
1670-01-247-2389	Bracket, suspension	(8)
1670-01-162-2381	Tandem link assembly (Multipurpose link)	(2)
5530-00-128-4981	Plywood, 3/4-in	3 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
	Sling, cargo, airdrop For suspension:	
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	8
1670-01-063-7760	11-ft (2-loop), type XXVI nylon webbing	2
1670-01-063-7761	16-ft (2-loop), type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), type XXVI nylon webbing	4
	For deployment:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6311	120-ft (2-loop), type XXVI nylon webbing	6
	For lifting slings:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	2
5340-00-040-8219	Strap, parachute release, multi-cut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	96
8310-00-917-3945	Thread, Cotton, Ticket 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-261-8584	Nylon, Type X	As required

Chapter 2

Rigging the 350-GPM Wheel-Mounted POL Pumping Assembly with Filter/ Separator

DESCRIPTION OF LOAD

2-1. The 4-inch, 350-GPM wheel-mounted POL pumping assembly with filter/ separator (Figure 2-1) is rigged on a 16-foot type V platform for low-velocity airdrop with two G-11 cargo parachutes. It consists of two pumps, each weighing 2,100 pounds and two filter/separators each weighing 425 pounds. It is approximately 76 3/4 inches in height, 108 inches in width, and 215 inches in length with an overhang of 5 inches in the front and 18 inches in the rear. The total rigged weight is 7,880 pounds.

PREPARING PLATFORM

2-2. Prepare a 16-foot type V airdrop platform using two tandem links, four suspension brackets, and 16 tie-down clevises as shown in Figure 2-2.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

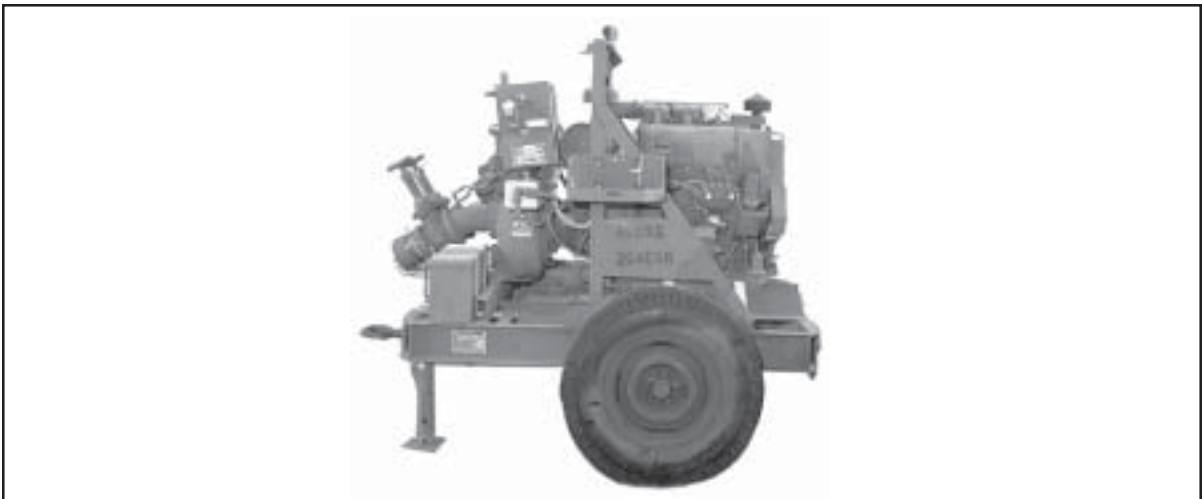


Figure 2-1. Pumping Assembly with Filter/Separator

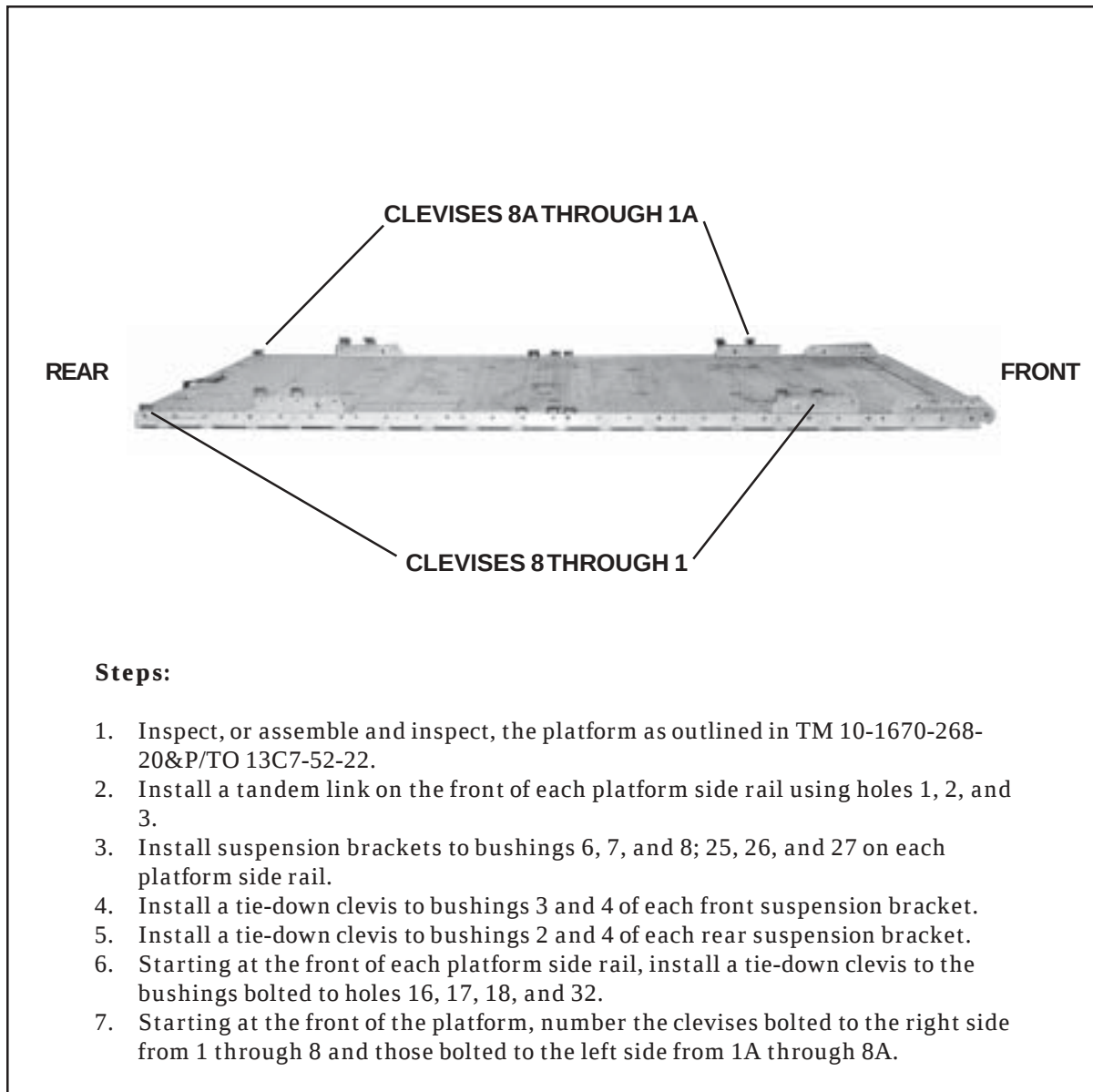


Figure 2-2. Platform Prepared

PREPARING HONEYCOMB

2-3. Build honeycomb stack as shown in Figures 2-3 through 2-6.



Stack Number	Pieces	Width (Inches)	Length (Inches)	Material	Instructions
1 & 4	1	51	16	Honeycomb	Form a base.
	2	16	16	Honeycomb	Glue one end on each side of the base.
	1	16	64	Honeycomb	Glue one end centered between the 16- by 16-inch pieces and flush with the front edge of the base.
	2	51	16	Honeycomb	Glue on base.
	2	51	16	Honeycomb	Notch the right and left front corner of each piece with an 8- by 8-inch cutout and glue to the base.
	2	23	16	Honeycomb	Notch one corner of each piece with an 8- by 8-inch cutout and glue one on the right and one on the left side of the base.
	2	4	7	3/4-in Plywood	Glue one piece on the right and left side of the base.
	2	14	4	3/4-in Plywood	Glue one piece on the right and left side of the base.

Figure 2-3. Honeycomb Stacks 1 and 4 Prepared

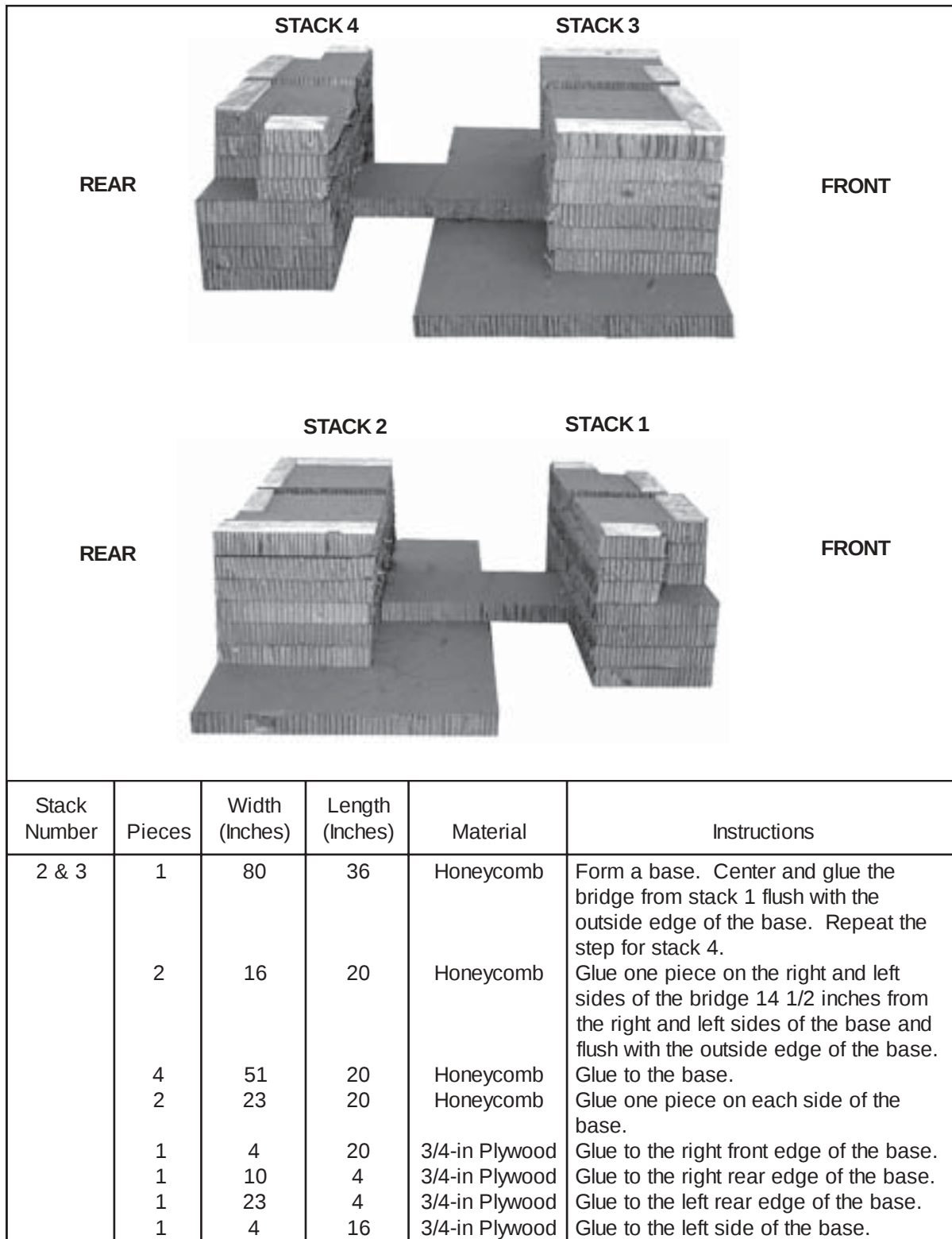


Figure 2-4. Honeycomb Stacks 2 and 3 Prepared

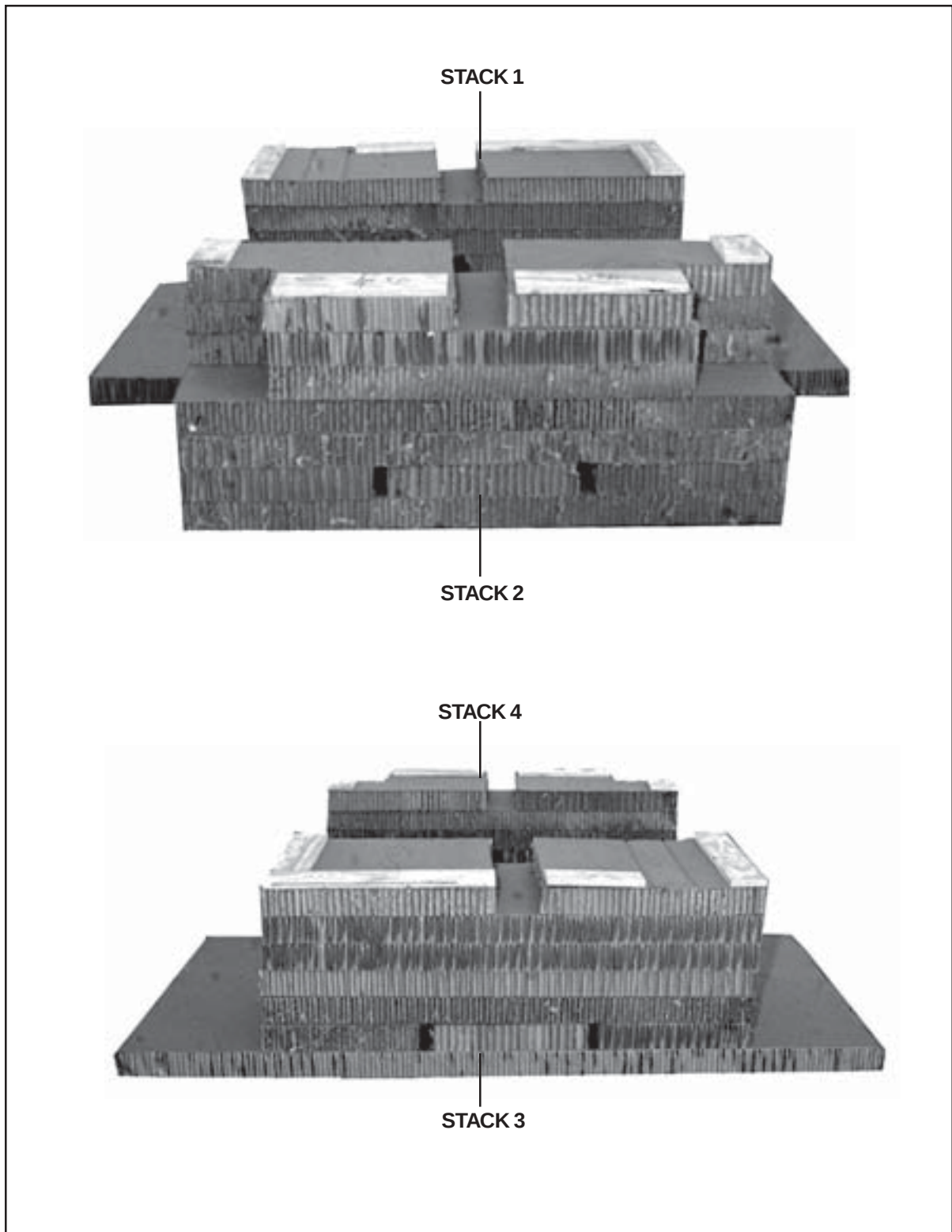
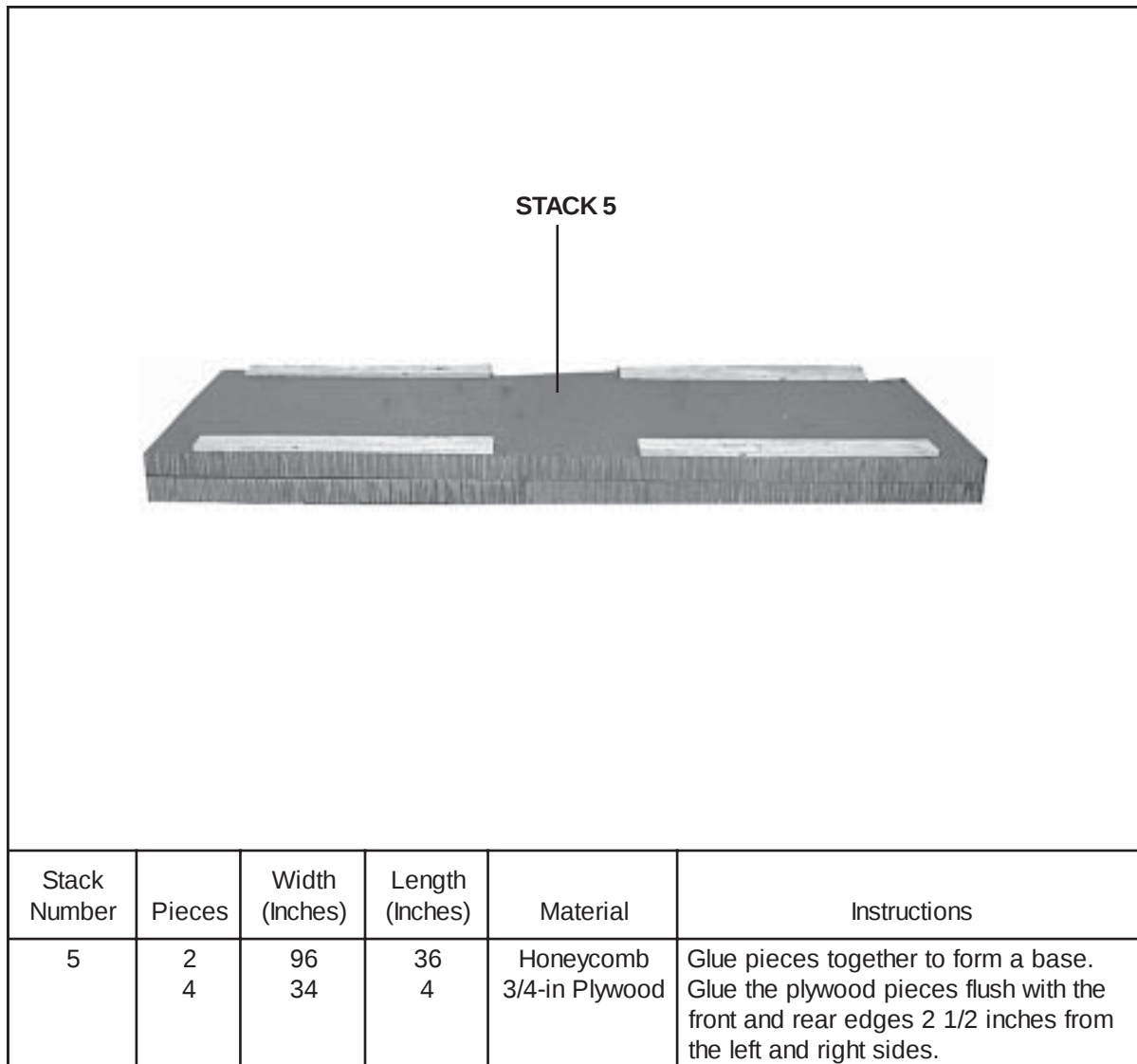


Figure 2-5. Honeycomb Stacks 1, 2, 3, and 4 Prepared

**Figure 2-6. Honeycomb Stack 5 Prepared**

POSITIONING HONEYCOMB STACKS

2-4. Position honeycomb stacks as shown in Figure 2-7.

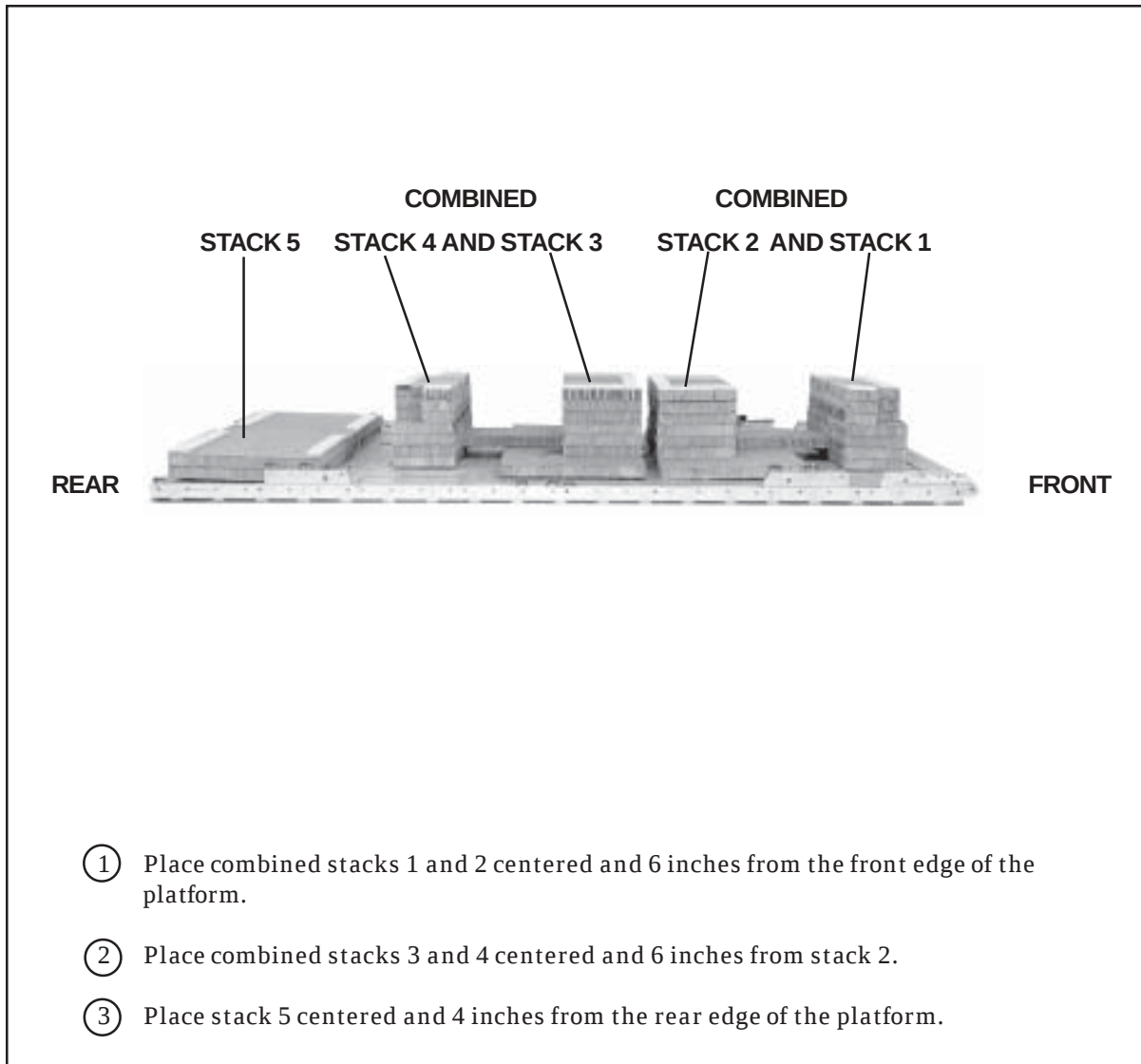
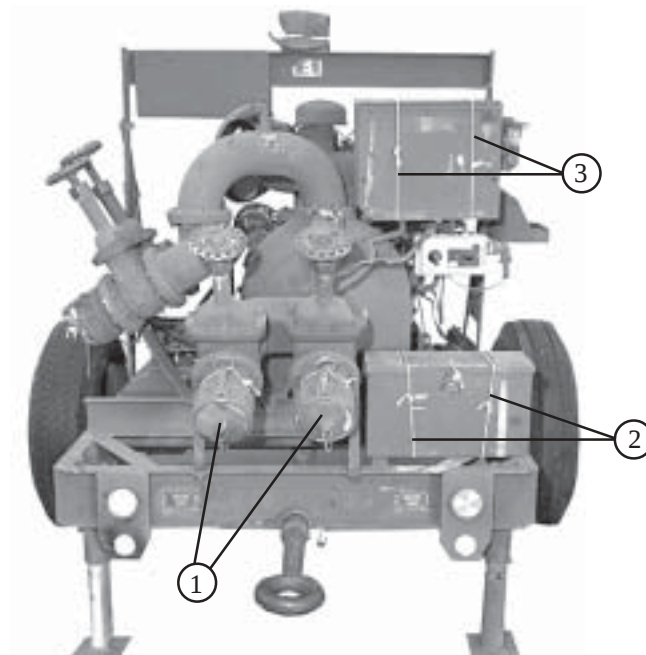


Figure 2-7. Honeycomb Stacks Positioned

PREPARING THE PUMP ASSEMBLY AND FILTER/SEPARATOR

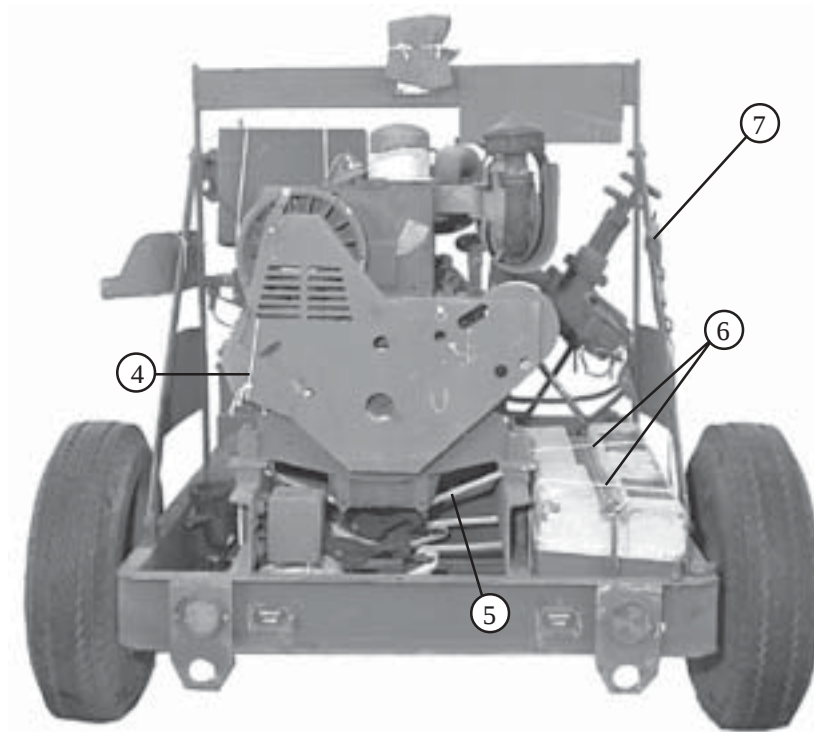
2-5. Prepare the pump assembly and filter/separator as shown in Figure 2-8.

Note: The fuel pump must be drained of all fuel and the filter/separator purged and ventilated.



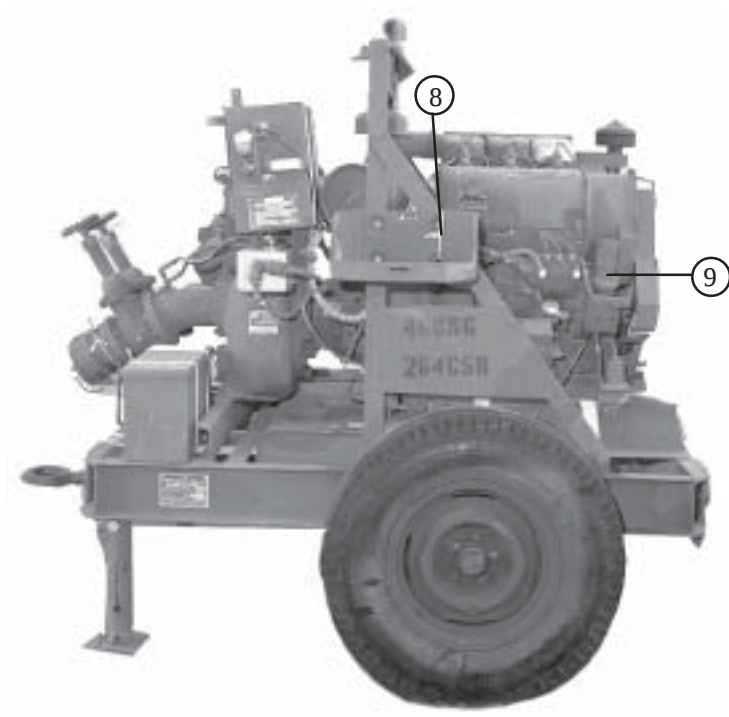
- ① Secure all fuel caps with type III nylon cord.
- ② Secure lid to storage box with type III nylon cord.
- ③ Secure cover to control panel with type III nylon cord.

Figure 2-8. Pump Assembly and Filter/Separator Prepared



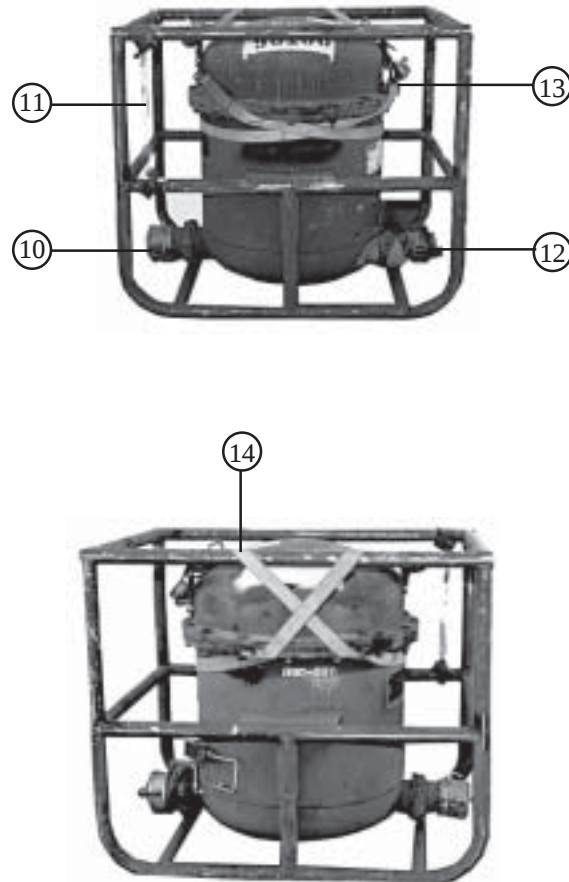
- ④ Secure the starter/speed control box to the attaching bracket with type III nylon cord.
- ⑤ Support the engine by running two 15-foot lashings around the frame supports and under the oil pan. Space the lashings to the front and rear of the oil pan.
- ⑥ Remove the battery box lids and secure each battery to its own box with type III nylon cord. Replace the lids and secure in place with 1/2-inch tubular nylon webbing, going around both boxes and bottom supports.
- ⑦ Secure the ground rod in its holder with type III nylon cord.

Figure 2-8. Pump Assembly and Filter/Separator Prepared (continued)



- ⑧ Secure fuel can bracket to frame with type III nylon cord.
- ⑨ Tape oil cap in place with cloth-backed adhesive tape.

Figure 2-8. Pump Assembly and Filter/Separator Prepared (continued)



- ⑩ Secure fuel caps on the filter/separator with type III nylon cord.
- ⑪ Secure the ground cable to the frame with cloth-backed adhesive tape.
- ⑫ Pad the small outlet valve with cellulose padding and cloth-backed tape.
- ⑬ Run a 15-foot lashing around the filter under the bolted top on the inlet side and around the top lateral frame support and secure.
- ⑭ Run a 15-foot lashing around the filter under the bolted top on the outlet side and around the top lateral frame support and secure.

Figure 2-8. Pump Assembly and Filter/Separator Prepared (continued)

POSITIONING THE PUMP ASSEMBLY AND FILTER/SEPARATOR

2-6. Position the pump assembly and filter/separator as shown in Figure 2-9.

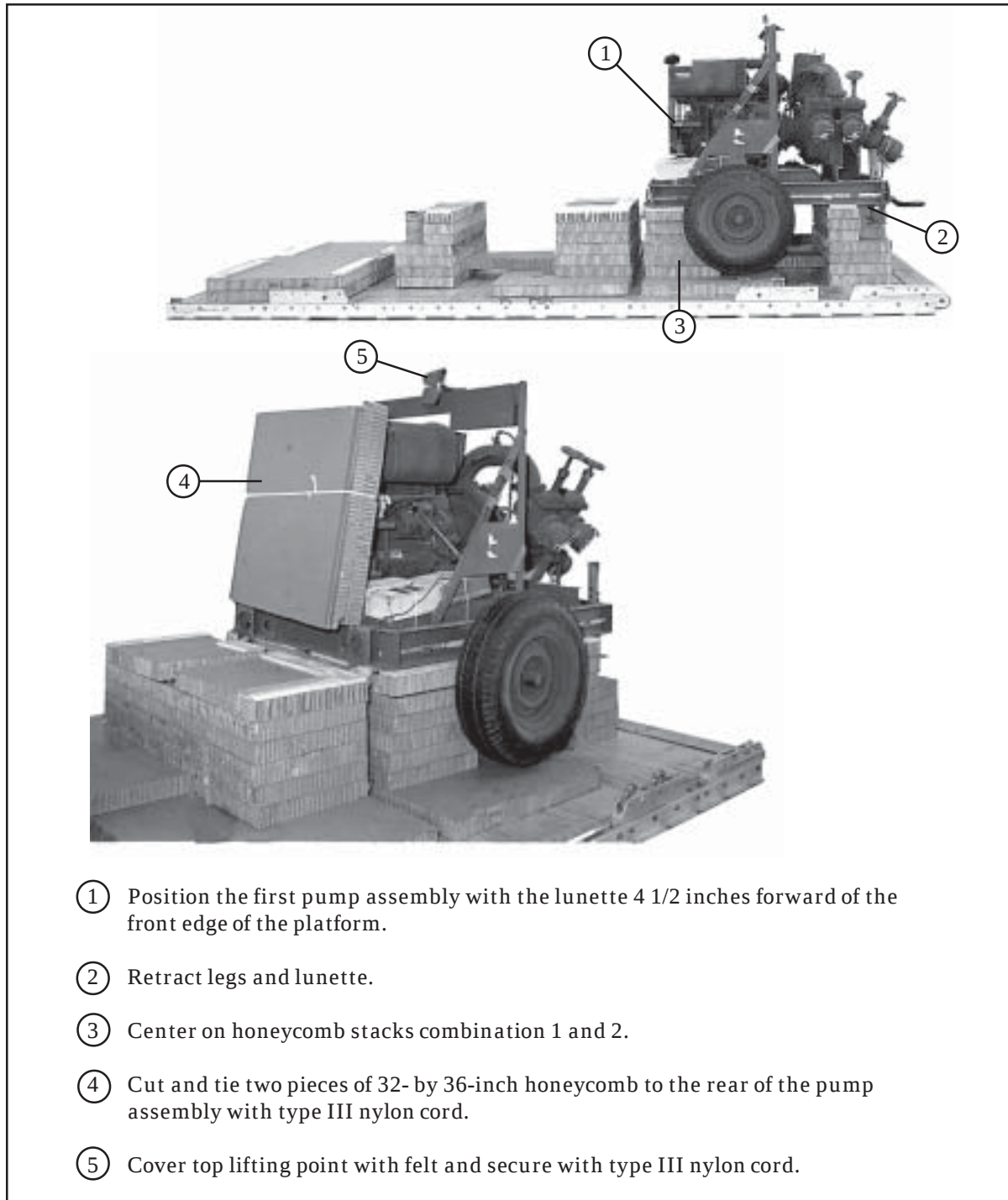


Figure 2-9. Pump Assembly and Filter/Separator Positioned

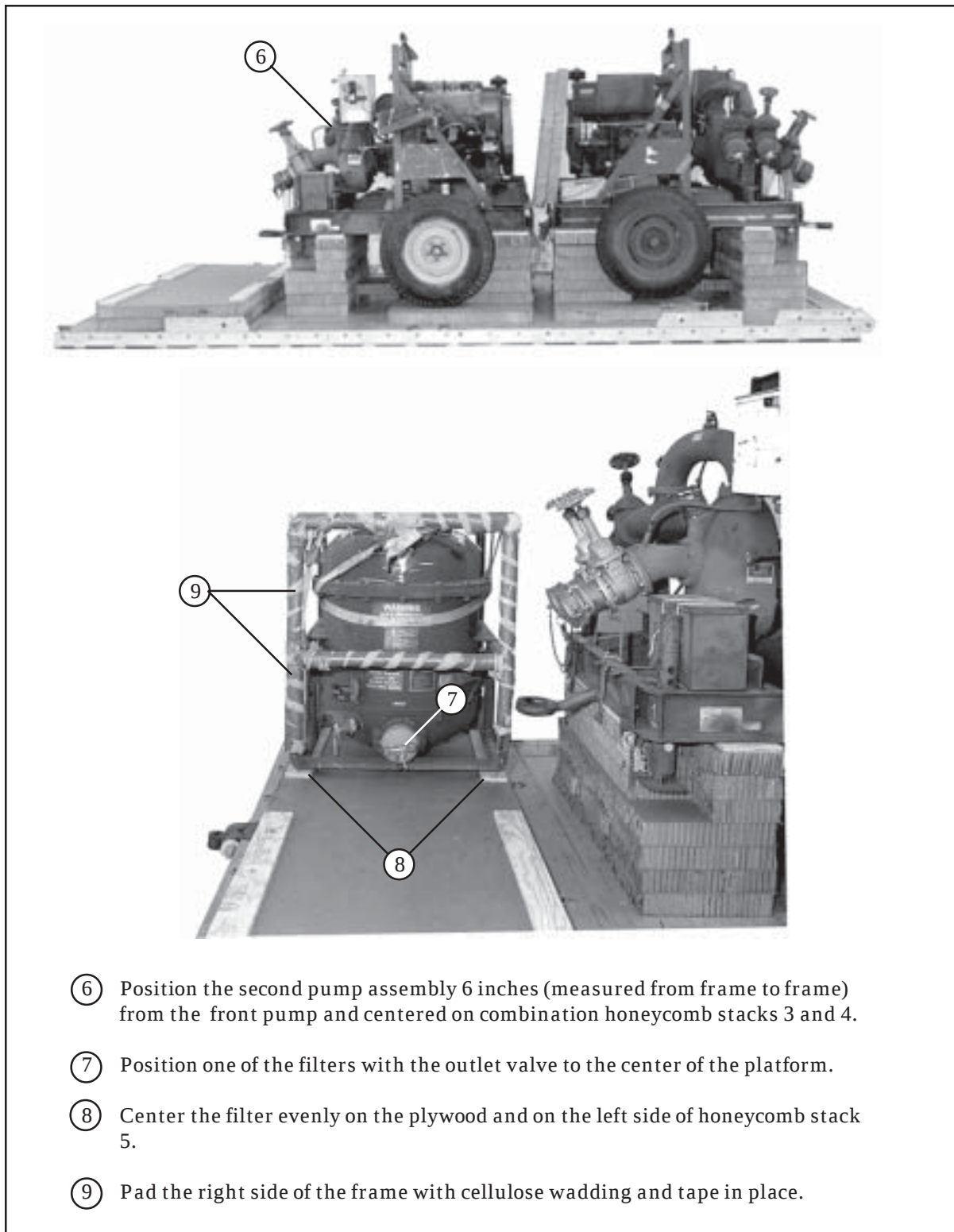
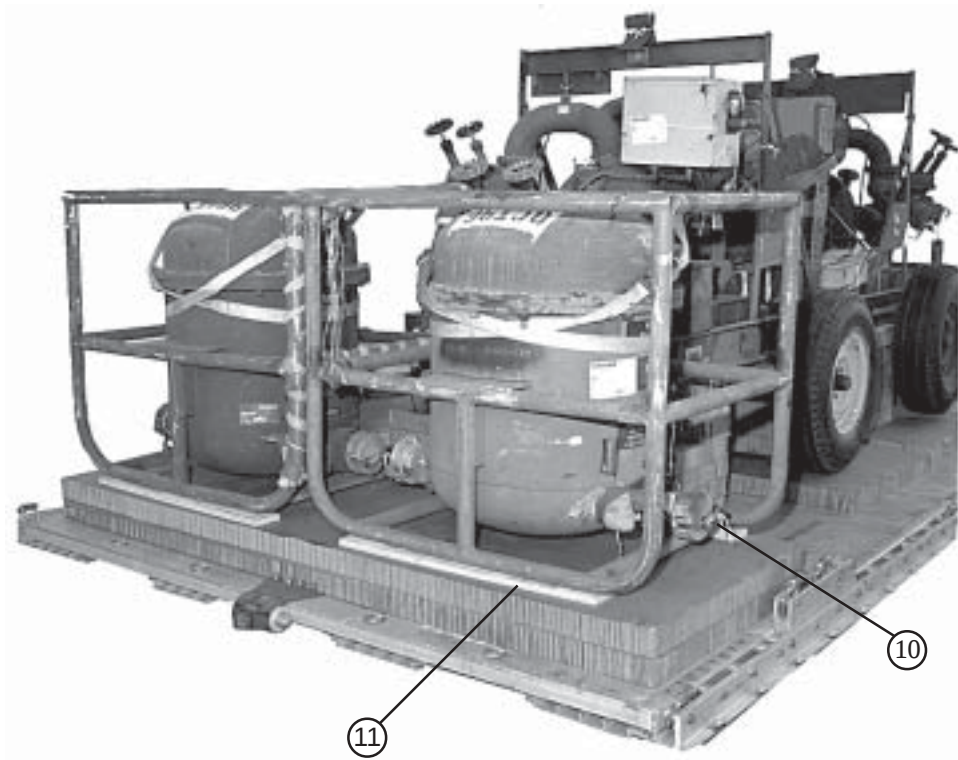


Figure 2-9. Pump Assembly and Filter/Separator Positioned (continued)

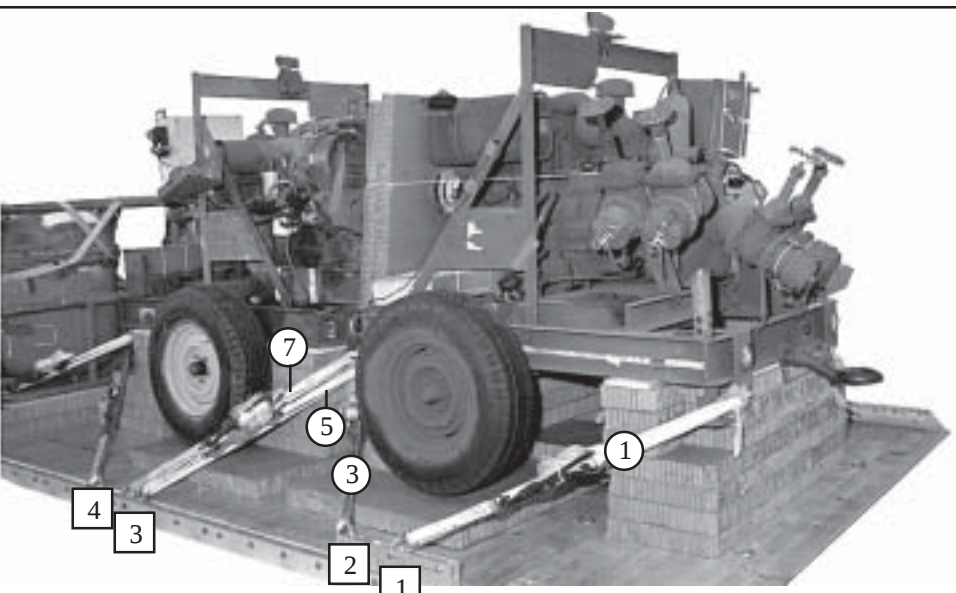


- ⑩ Position the second filter with the outlet valve facing to the right side of the platform.
- ⑪ Center the filter evenly on the plywood and on the right side of honeycomb stack 5.

Figure 2-9. Pump Assembly and Filter/Separator Positioned (continued)

LASHING THE PUMP ASSEMBLY AND FILTER/SEPARATOR TO THE PLATFORM

2-7. Lash the pump assembly and filter/separator to the platform using eighteen 15-foot tie-down assemblies as shown in Figures 2-10 and 2-11.



Lashing Number	Tie-down Clevis Number	Instructions
1	1	Pass lashing: Through right front tie-down point on front pump assembly.
2	1A	Through left front tie-down point on front pump assembly.
3	2	Through right rear tie-down point on front pump assembly.
4	2A	Through left rear tie-down point on front pump assembly.
5	3	Through right rear tie-down point on front pump assembly.
6	3A	Through left rear tie-down point on front pump assembly.
7	4	Through left rear tie-down point on rear pump assembly.
8	4A	Through right rear tie-down point on rear pump assembly.

Figure 2-10. Lashings 1 Through 8 Installed

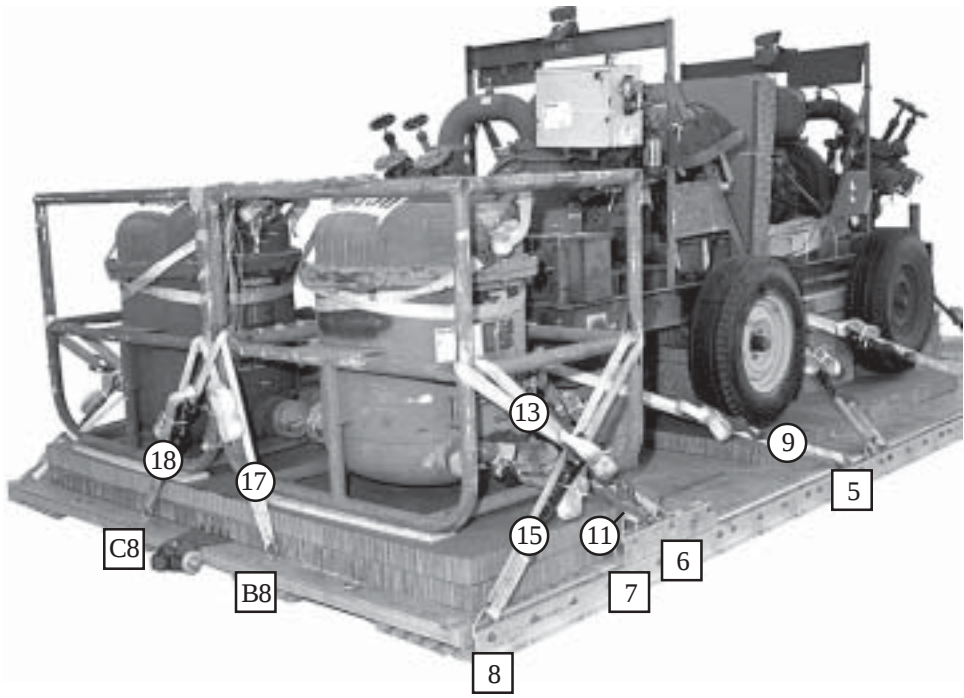
		
Lashing Number	Tie-down Clevis Number	Instructions
9	5	Pass lashing: Through left front tie-down point on rear pump assembly.
10	5A	Through right front tie-down point on rear pump assembly.
11	7	Through left front tie-down point on rear pump assembly.
12	7A	Through right front tie-down point on rear pump assembly.
13	6	Through and around right rear vertical frame.
14	6A	Through and around left rear vertical frame.
15	8	Through and around right front vertical frame.
16	8A	Through and around left front vertical frame.
17	B8	Through and around both rear center vertical frame.
18	C8	Through and around both rear center vertical frame.

Figure 2-11. Lashings 9 Through 18 Installed

CONSTRUCTING THE PARACHUTE STOWAGE TRAY AND LOAD COVER

2-8. Construct the parachute stowage tray and load cover as shown in Figure 2-12.

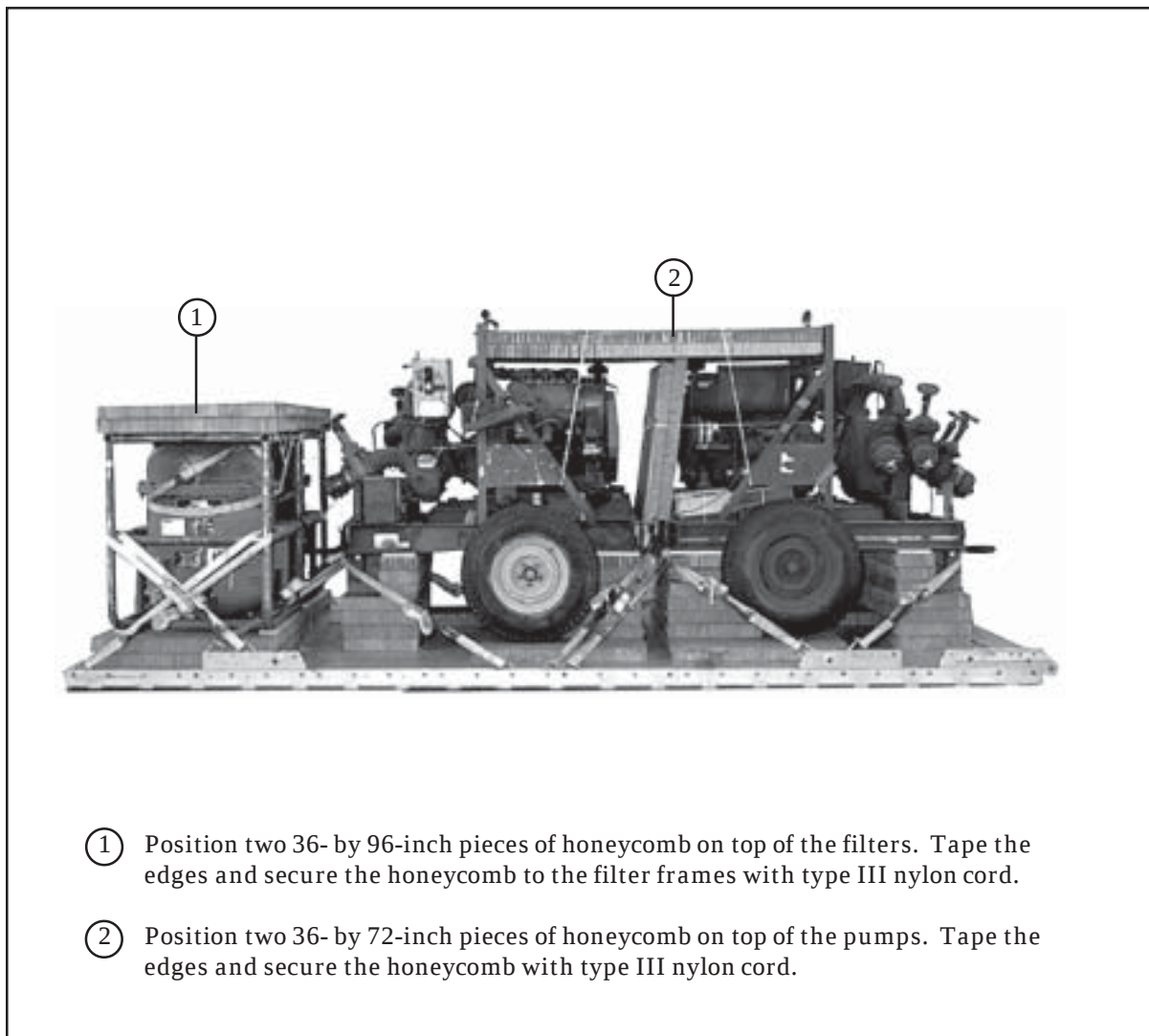


Figure 2-12. Parachute Stowage Tray and Load Cover Constructed

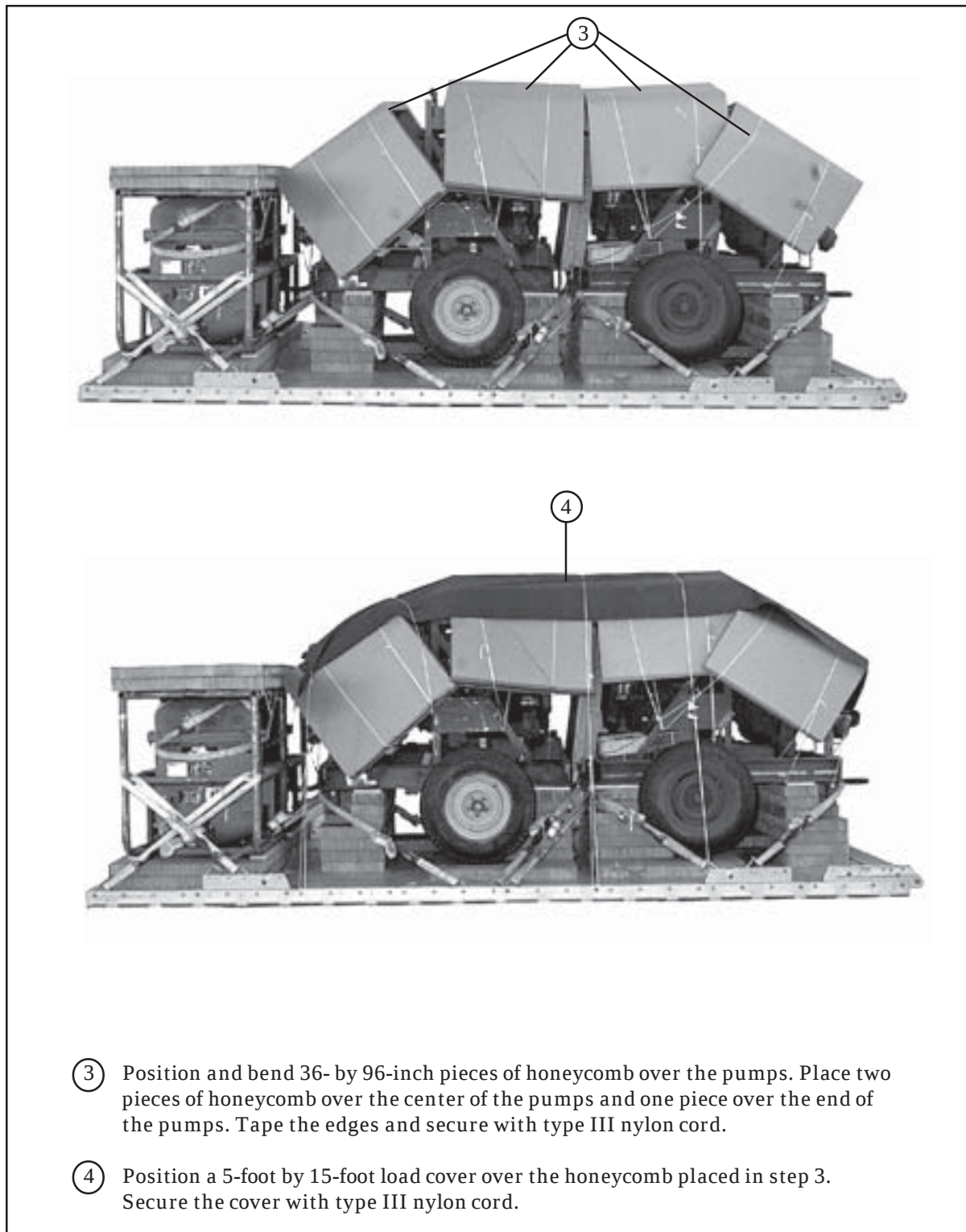
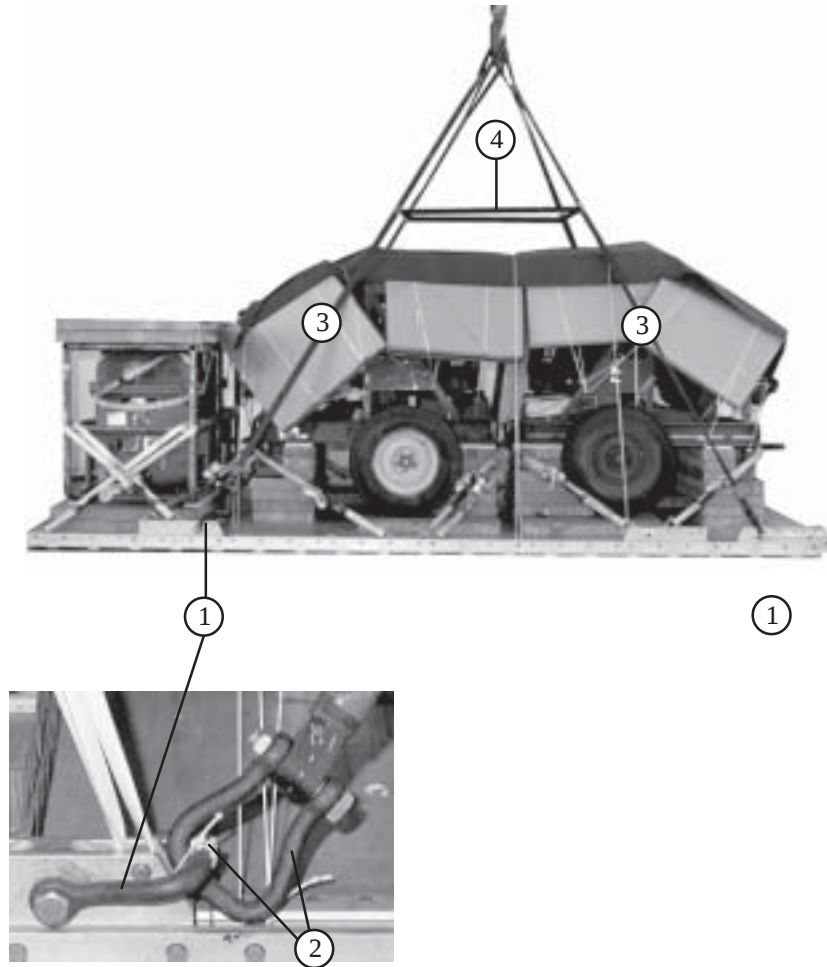


Figure 2-12. Parachute Stowage Tray and Load Cover Constructed (continued)

INSTALLING THE SUSPENSION SLINGS AND DEADMAN'S TIE

2-9. Install the suspension slings and deadman's tie as shown in Figure 2-13.



- ① Attach a large suspension clevis to each front and rear suspension link.
- ② Attach an additional large suspension clevis to each rear suspension clevis. Tie the two clevises together with type III nylon cord.
- ③ Attach a 12-foot (2-loop), type XXVI nylon webbing sling to each front suspension clevis and each rear set of suspension clevises.
- ④ Raise the slings and install the deadman's tie according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

Figure 2-13. Suspension Slings and Deadman's Tie Installed

PREPARING, STOWING, AND RESTRAINING CARGO PARACHUTES

2-10. Prepare, stow, and restrain two G-11 cargo parachutes on the parachute stowage tray according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 2-14.

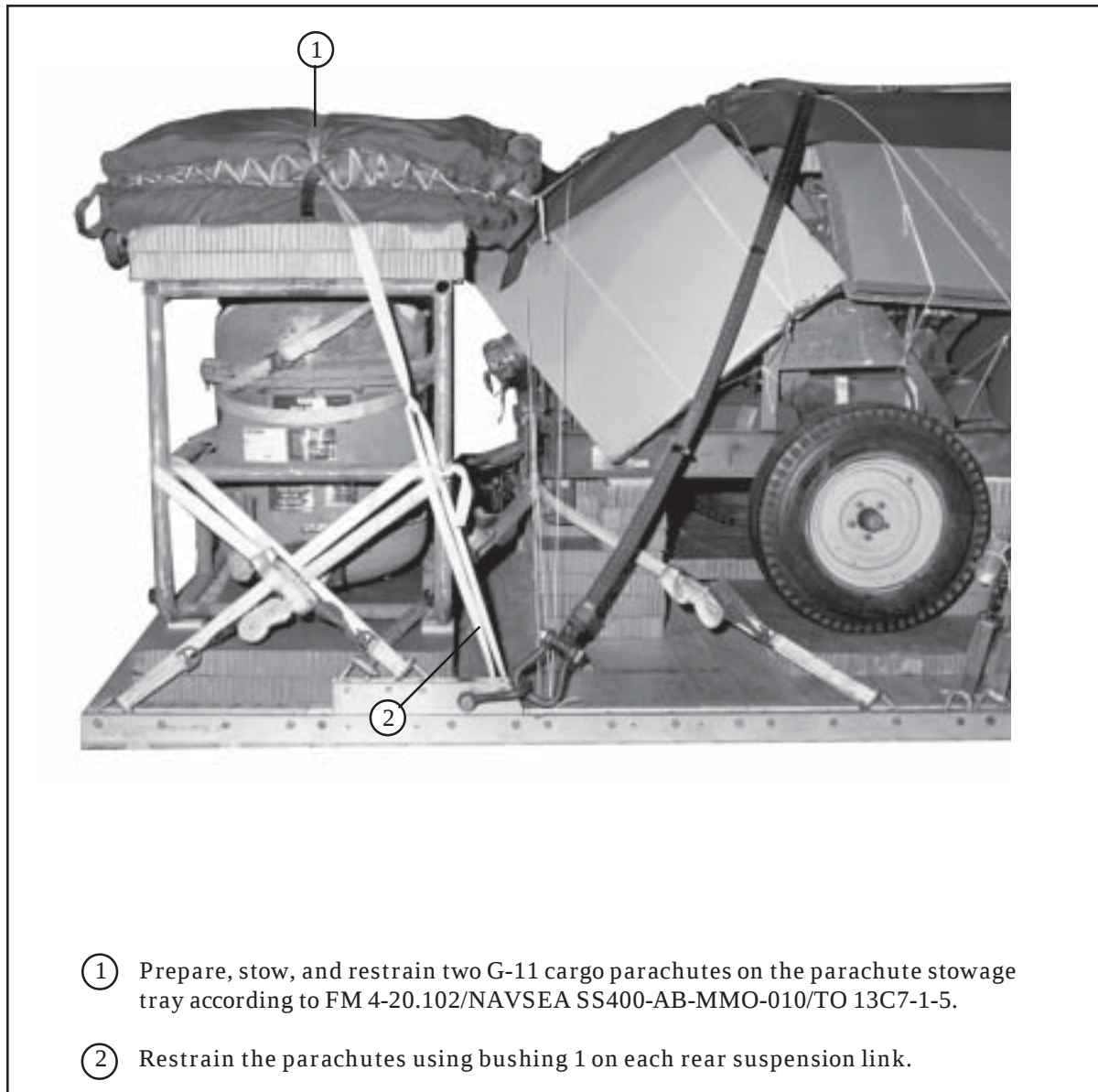
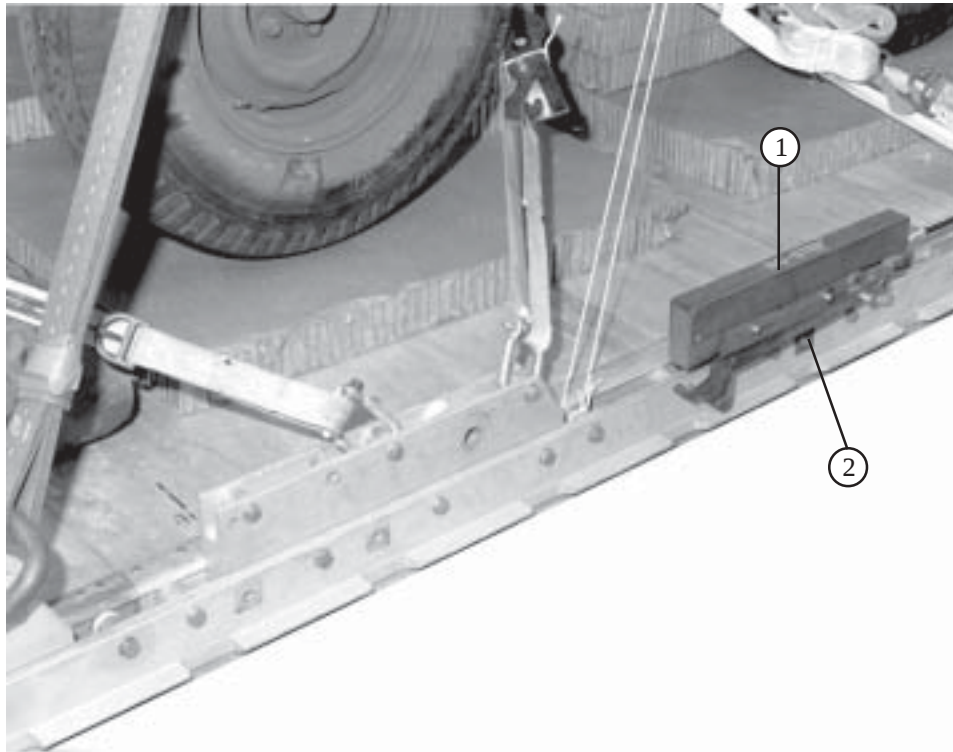


Figure 2-14. Cargo Parachutes Stowed

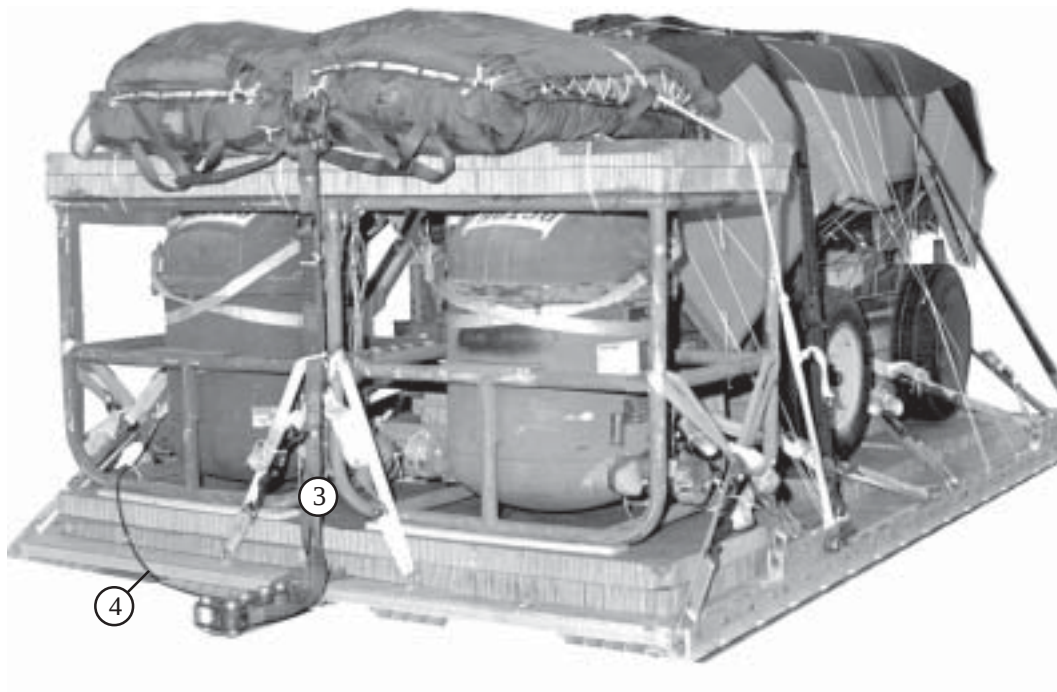
INSTALLING THE EXTRACTION SYSTEM

2-11. Install the components of the extraction force transfer coupling according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 2-15.



- ① Install the components of the EFTC according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
- ② Install the EFTC actuator mounting brackets in the rear holes on the left platform side rail according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

Figure 2-15. Extraction System Installed

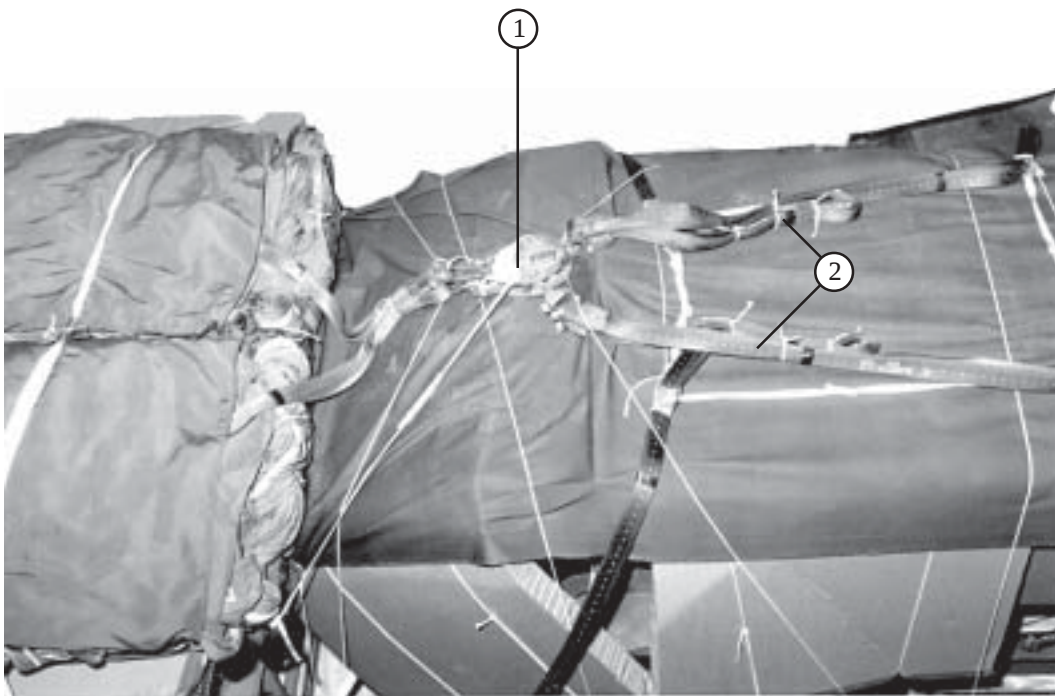


- ③ Attach a 9-foot (2-loop), type XXVI nylon webbing sling to be used as a deployment line.
- ④ Use a 16-foot EFTC cable and safety the cable to tie-down ring D-8 using one turn of type I, 1/4-inch cotton webbing.

Figure 2-15. Extraction System Installed (continued)

INSTALL PARACHUTE RELEASE SYSTEM

2-12. Install the M-1 parachute release system according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 2-16.



- ① Position and install the M-1 parachute release assembly according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Safety tie the M-1 parachute release assembly to convenient points on the load.
- ② S-fold and tie any slack in the suspension slings with type I, 1/4-inch cotton webbing.

Figure 2-16. M-1 Cargo Parachute Release System Installed

PLACING EXTRACTION PARACHUTE

2-13. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

2-14. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

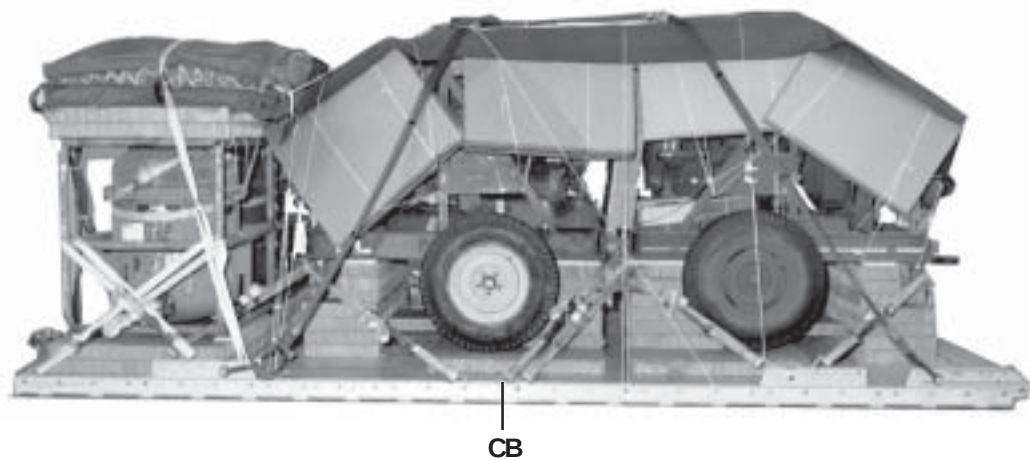
2-15. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 2-17. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

2-16. Use the equipment list in Table 2-1 to rig the load shown in Figure 2-17.

CAUTION:

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.

**RIGGED LOAD DATA**

Weight	7,880 pounds
Maximum Weight	10,000 pounds
Height	77 inches
Width	108 inches
Overall Length	214.5 inches
Overhang: Front (lunette on front pump)	4.5 inches
Rear (EFTC)	18 inches
Center of Balance (CB) (from front edge of platform)	100 inches
Extraction System	EFTC

Figure 2-17. 350-GPM Wheel-Mounted POL Pumping Assembly with Filter/Separator Rigged for Low-Velocity Airdrop

Table 2-1. Equipment Required for 350-GPM Wheel-Mounted POL Pumping Assembly with Filter/Separator

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive, paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	7
4030-00-678-8562	Clevis, medium	6
8305-00-880-8155	Cloth, coated, 60-inch	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5785	Coupling, airdrop, extraction force transfer with 16-ft cable	1
1670-00-360-0328	Cover, clevis, large	2
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
5365-00-937-0147	D-ring, heavy duty, 10,000-lb	68
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, parachute bag (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add 2 for DES)	2
1670-01-062-6313	Line, drogue (for DES): 60-foot (1-loop), type XXVI	1
1670-01-064-4452	Line extraction: For C-130: 60-ft (1-loop), type XXVI	1
1670-01-107-7651	For C-141, C-5, and C-17: 140-ft, (3-loop), type XXVI	1
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17	1
	Link assembly:	
	Two point: (double the quantity for DES)	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	(2)
5310-00-232-5165	Nut, 1-in, hexagonal	(2)
1670-00-003-1953	Plate, side, 3 3/4-in	(2)
5365-00-007-3414	Spacer, large	(2)
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3-by 36- by 96-in	20

Table 2-1. Equipment Required for 350-GPM Wheel-Mounted POL Pumping Assembly with Filter/Separator (continued)

National Stock Number	Item	Quantity
1670-01-016-7841	Parachute: Cargo, G-11B	2
1670-01-063-3715	Drogue, 15-ft (for DES)	1
1670-01-063-3716	Extraction, 22-ft	1
1670-01-353-8425	Platform, airdrop, type V, 16-ft: Bracket assembly, coupling	1
1670-01-162-2372	Clevis assembly, type V	16
1670-01-353-8424	Extraction bracket assembly	1
1670-01-247-2389	Bracket, suspension	4
1670-01-162-2389	Tandem link	2
5530-00-128-4981	Plywood, 3/4- by 48- by 96-in	1
1670-01-097-8816	Release, cargo parachute, M-1	1
1670-01-062-6303	Sling, cargo, airdrop: For suspension and lifting: 12-ft (2-loop), type XXVI nylon webbing	4
1670-01-062-6304	For deployment: 9-ft (2-loop), type XXVI nylon webbing	1
1670-00-040-8219	Strap, parachute release	1
7510-00-266-5016	Tape, cloth back, adhesive	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	38
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, yubular, 1/2-in	As required
8305-00-263-3591	Type VIII	As required

Chapter 3

Rigging 500-Gallon Drums with the 350-GPM Wheel-Mounted POL Pumping Assembly, Filter/Separator Assembly, and Hose Box

SECTION I - RIGGING THREE 500-GALLON DRUMS

DESCRIPTION OF LOAD

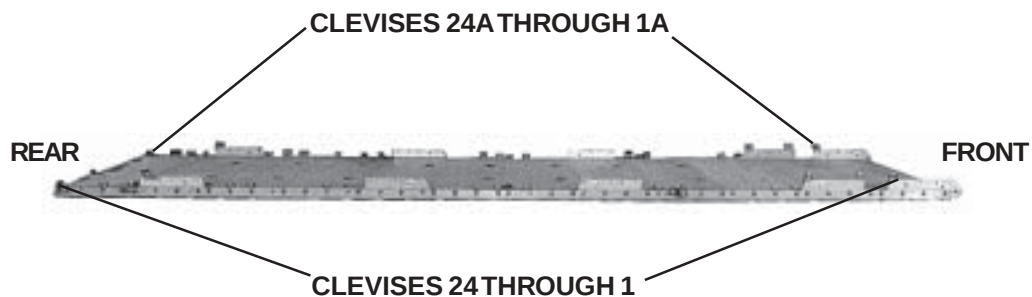
3-1. The three collapsible drums are rigged on a 24-foot platform with four G-11 cargo parachutes. Each drum is filled with a maximum of 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The 350-GPM pump with filter/separator and hose box are accompanying loads. The total rigged load has a maximum rigged weight of 21,000 pounds with a width of 108 inches and a length of 324 inches. It has an overhang of 18 inches in the front and 18 inches in the rear.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

3-2. Prepare a 24-foot type V airdrop platform using two tandem links, eight suspension brackets, and 48 tie-down clevises as shown in Figure 3-1.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

**Steps:**

1. Inspect, or assemble and inspect, the platform as outlined in TM 10-1670-268-20&P/TO 13C7-52-22.
2. Install a tandem link on the front of each platform side rail using holes 1, 2, and 3.
3. Install a suspension bracket to bushings 6, 7, and 8 on each platform side rail.
4. Install a suspension bracket to bushings 18, 19, and 20 on each platform side rail.
5. Install a suspension bracket to bushings 29, 30, and 31 on each platform side rail.
6. Install a suspension bracket to bushings 41, 42, and 43 on each platform side rail.
7. Install a tie-down clevis to bushing 4 of each tandem link.
8. Install a tie-down clevis to bushings 1 and 4 of each first suspension bracket.
9. Install a double clevis to bushing 4 of the fourth suspension bracket.
10. Starting at the front of each platform side rail, install a tie-down clevis to the bushings bolted to holes 9, 10, 15 (triple), 16, 23, 24, 25, 26, 33, 34, 38, 39, 40, 44 (triple), 45, 46, and 48 (double).
11. Starting at the front of the platform, number the clevises bolted to the right side from 1 through 24 and those bolted to the left side from 1A through 24A.
12. Number the clevis on bushing 48 as clevis 24 and 24A and the doubled clevis as 23 and 23A.

Figure 3-1. Platform Prepared

PREPARING HONEYCOMB

3-3. Build honeycomb stack as shown in Figures 3-2 and 3-3.

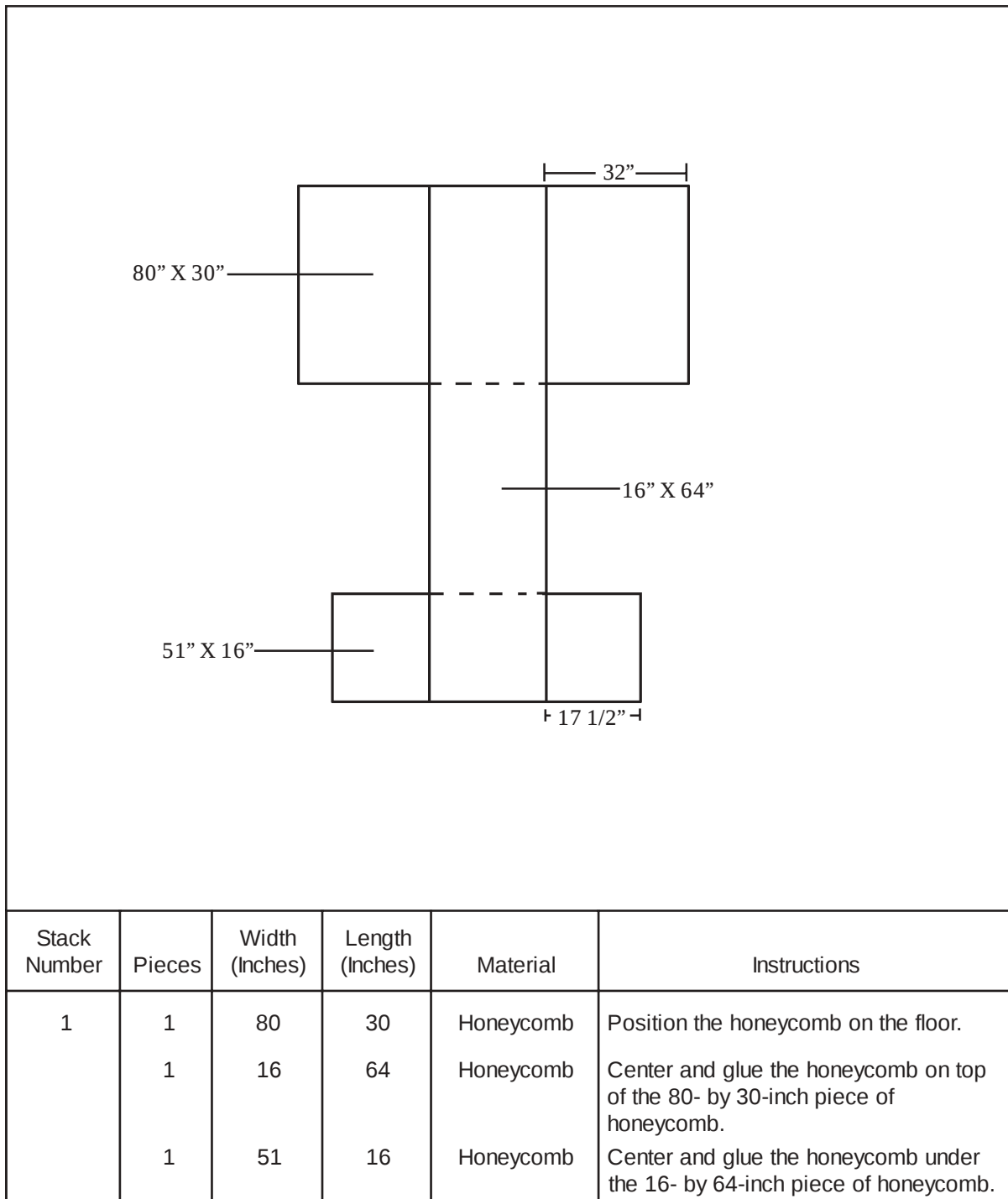


Figure 3-2. Honeycomb Stack 1 Prepared

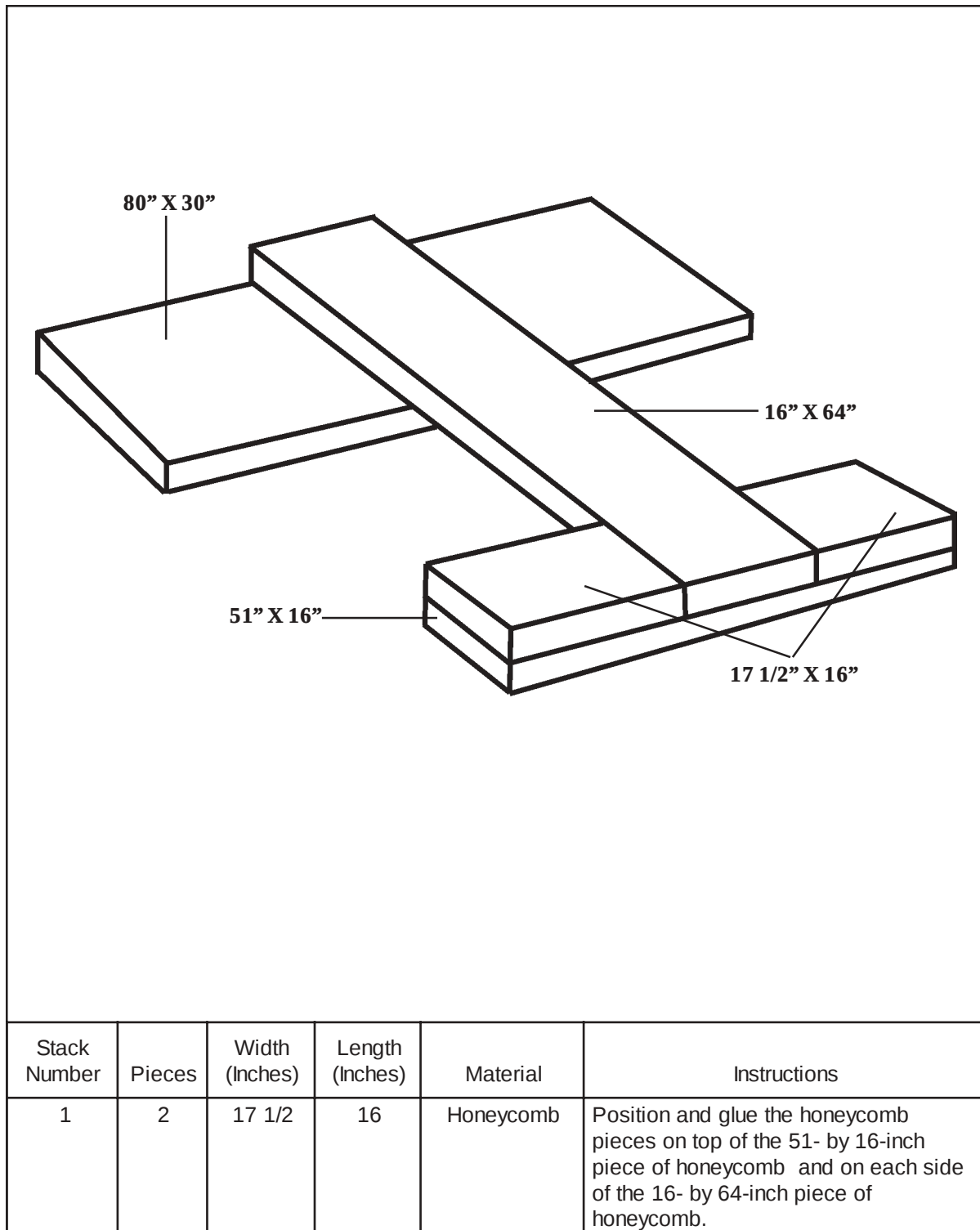


Figure 3-2. Honeycomb Stack 1 Prepared (continued)

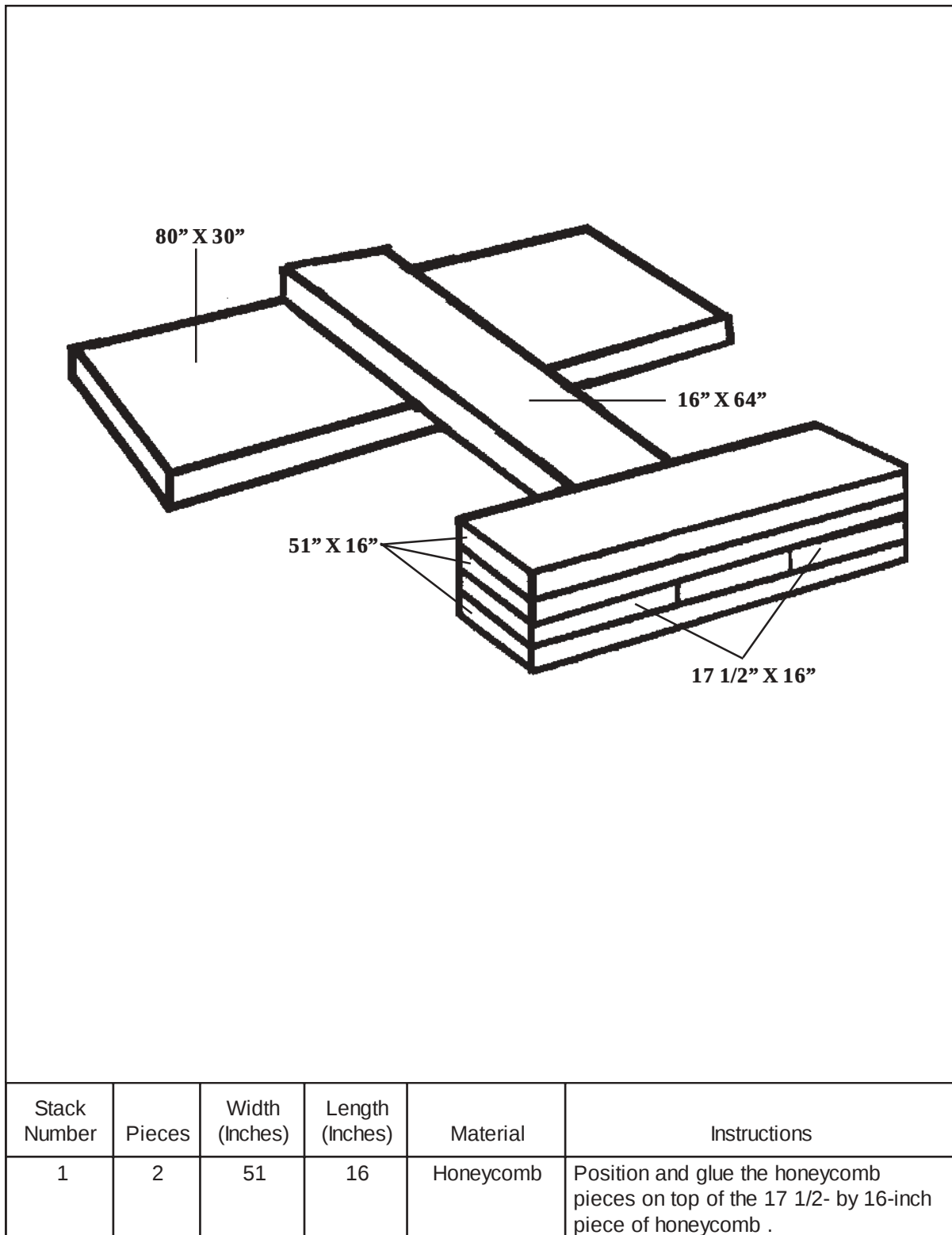


Figure 3-2. Honeycomb Stack 1 Prepared (continued)

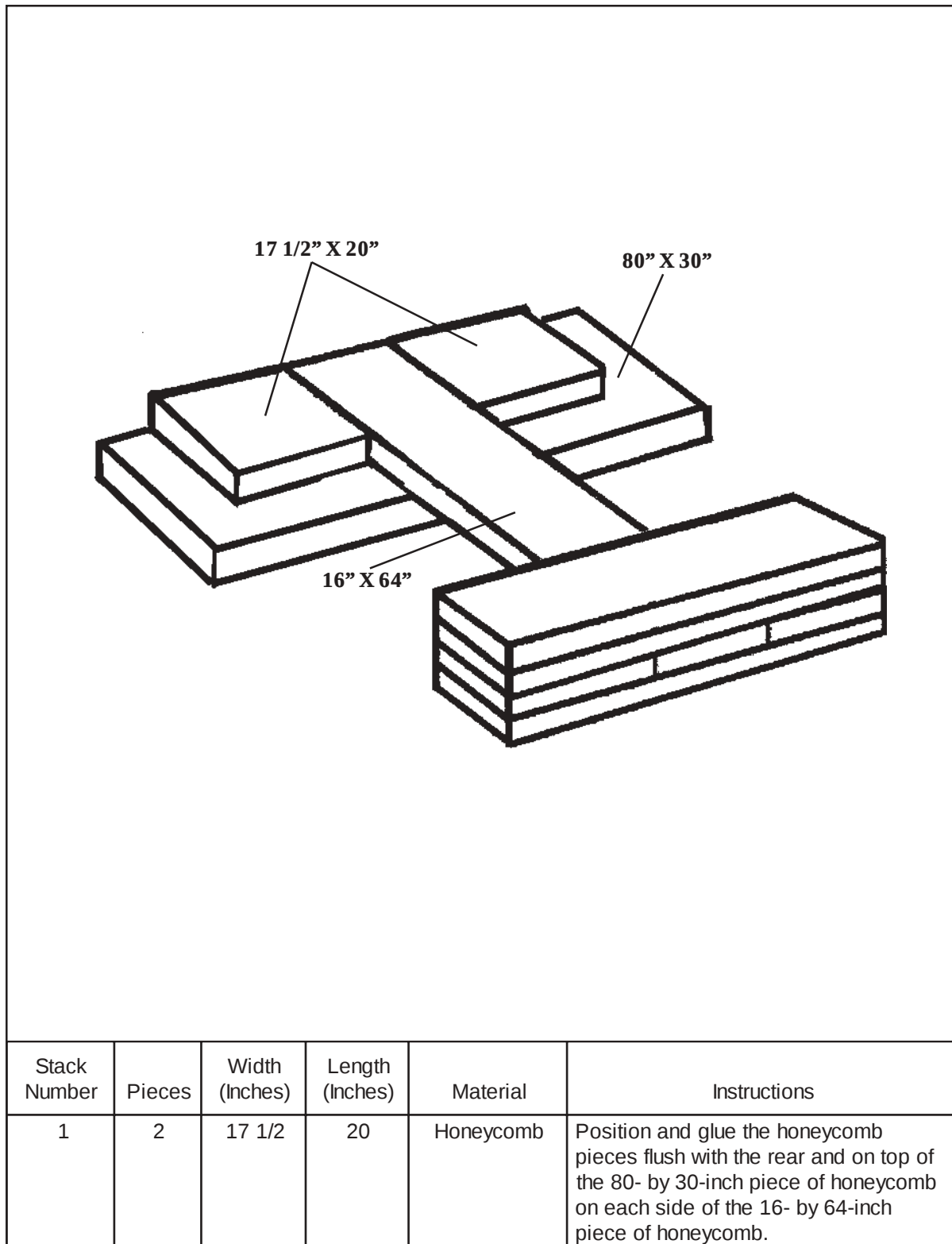


Figure 3-2. Honeycomb Stack 1 Prepared (continued)

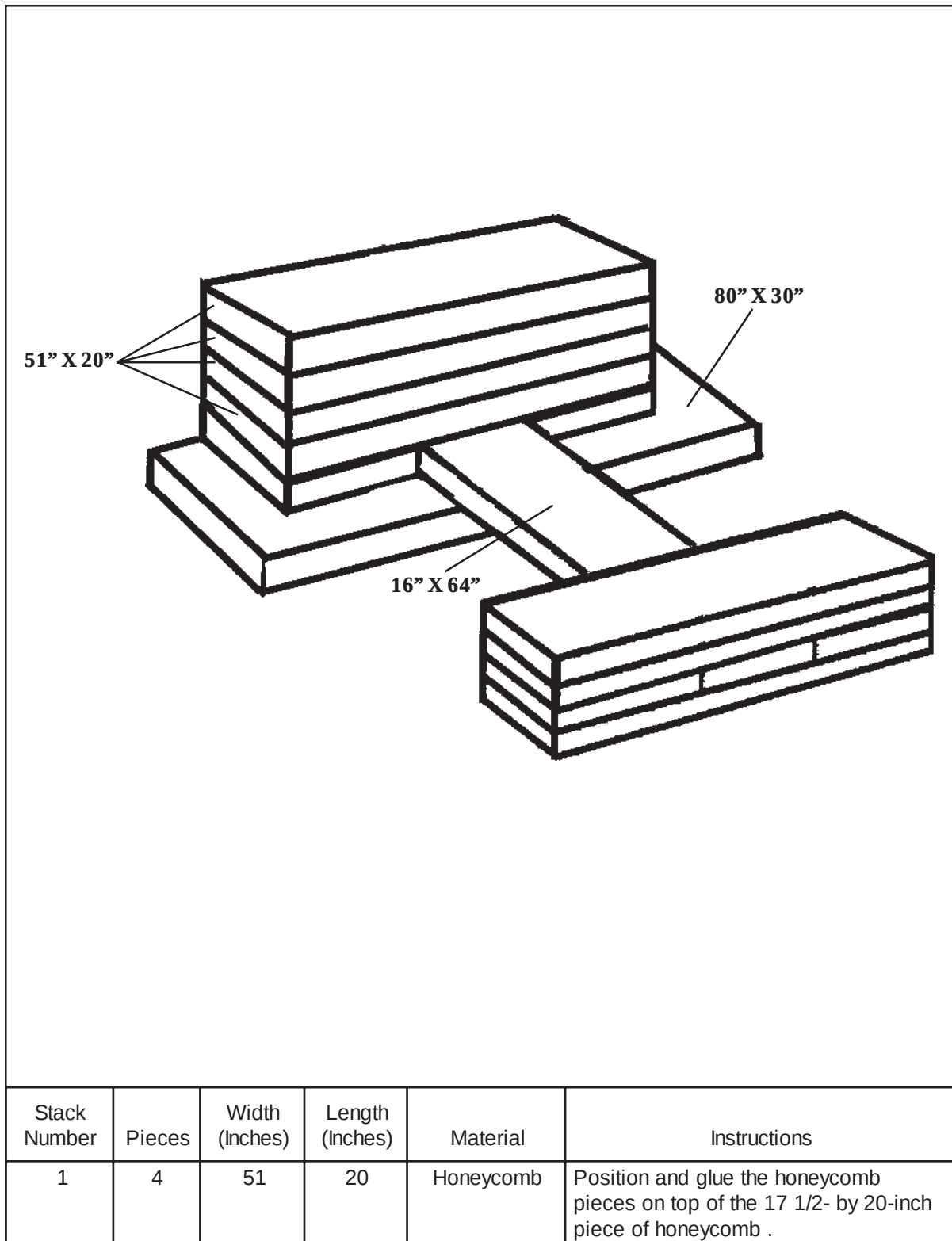
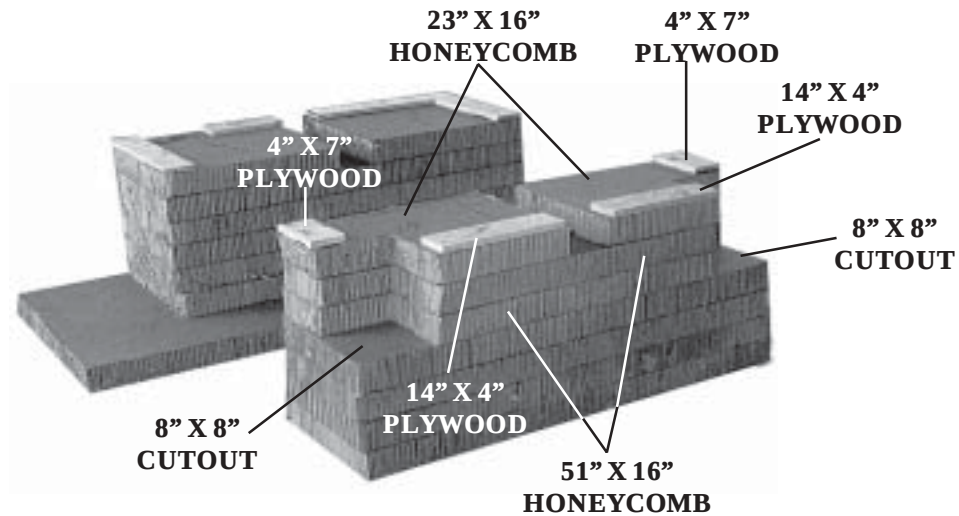
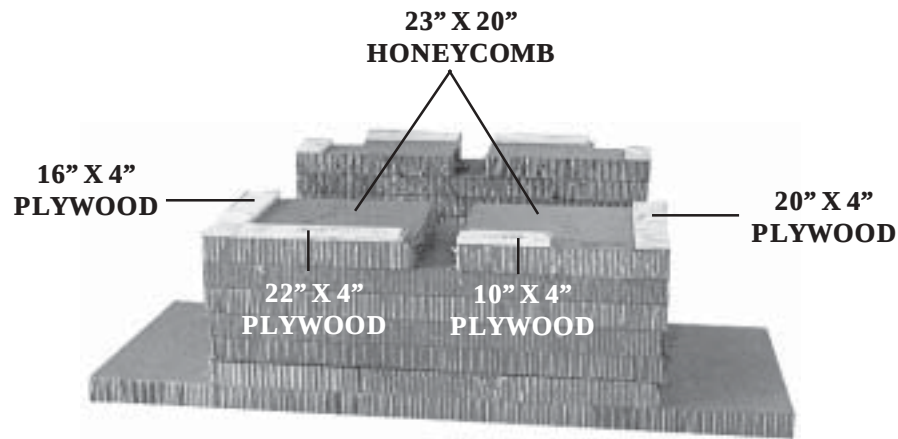


Figure 3-2. Honeycomb Stack 1 Prepared (continued)



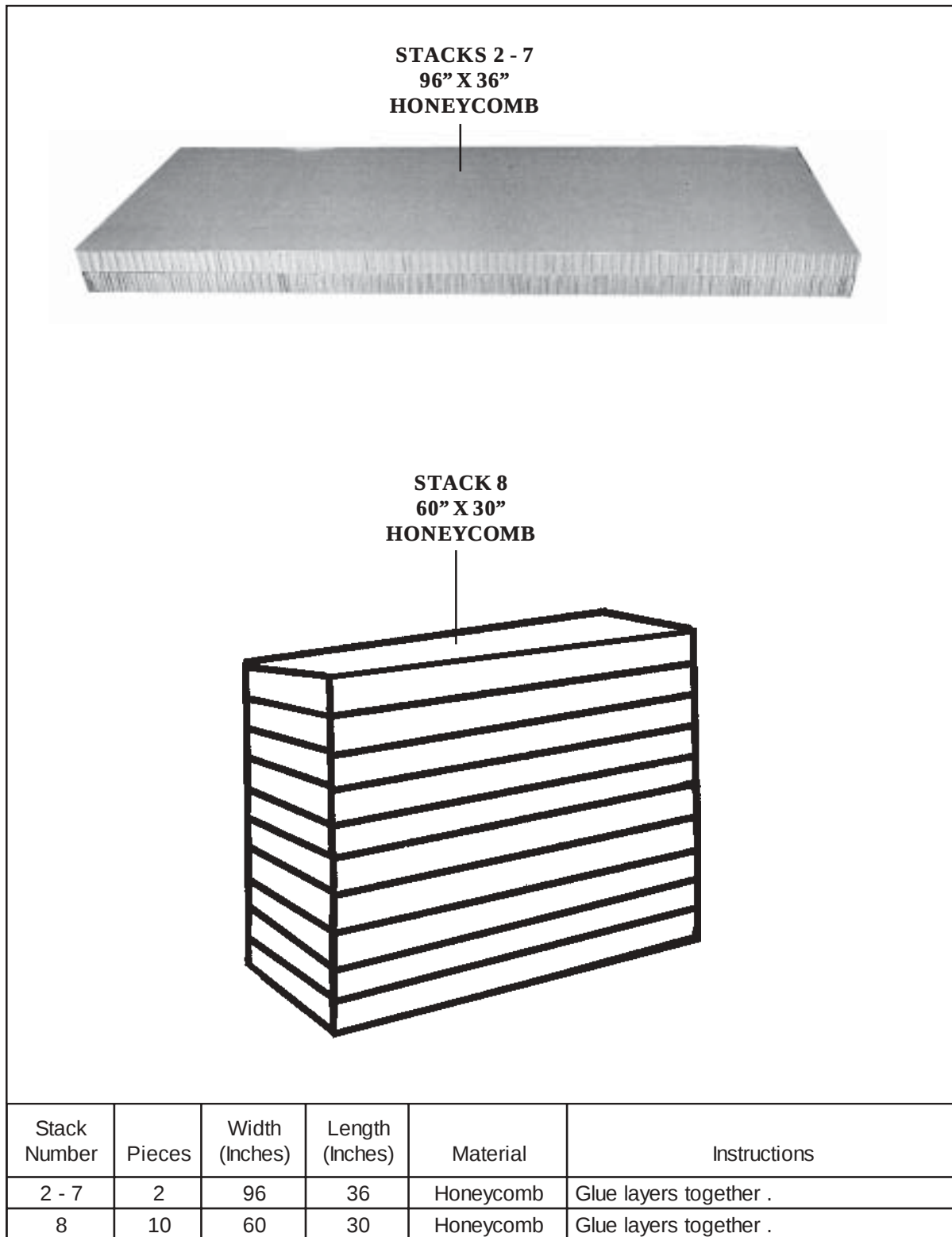
Stack Number	Pieces	Width (Inches)	Length (Inches)	Material	Instructions
1	2	51	16	Honeycomb	Cut an 8- by 8-inch cutout on each piece of honeycomb. Position and glue the two 51- by 16-inch pieces with cutouts on top of the 51- by 16-inch pieces of honeycomb.
	2	23	16	Honeycomb	Cut an 8- by 8-inch cutout on each piece of honeycomb. Position the pieces on top of the 51- by 16-inch pieces. Align the cutouts and glue.
	2	4	7	3/4-in Plywood	Center and glue the plywood on the sides of the 23- by 16-inch pieces of honeycomb.
	2	14	4	3/4-in Plywood	Center and glue the plywood on the front edge of the 23- by 16-inch pieces of honeycomb.

Figure 3-2. Honeycomb Stack 1 Prepared (continued)



Stack Number	Pieces	Width (Inches)	Length (Inches)	Material	Instructions
1	2	23	20	Honeycomb	Position and glue the two 23- by 20-inch pieces of honeycomb on top of the 51- by 20-inch pieces of honeycomb aligning the outside edges.
	1	4	20	3/4-in Plywood	Position and glue the plywood on the right outside edge of the right 23- by 20-inch piece of honeycomb.
	1	10	4	3/4-in Plywood	Position and glue the plywood on the left rear edge of the right 23- by 20-inch piece of honeycomb.
	1	22	4	3/4-in Plywood	Position and glue the plywood on the rear edge of the left 23- by 20-inch piece of honeycomb.
	1	4	16	3/4-in Plywood	Position and glue the plywood on the left outside edge of the left 23- by 20-inch piece of honeycomb.

Figure 3-2. Honeycomb Stack 1 Prepared (continued)

**Figure 3-3. Honeycomb Stacks 2 Through 8 Prepared**

POSITIONING HONEYCOMB STACKS

3-4. Position honeycomb stacks as shown in Figure 3-4.

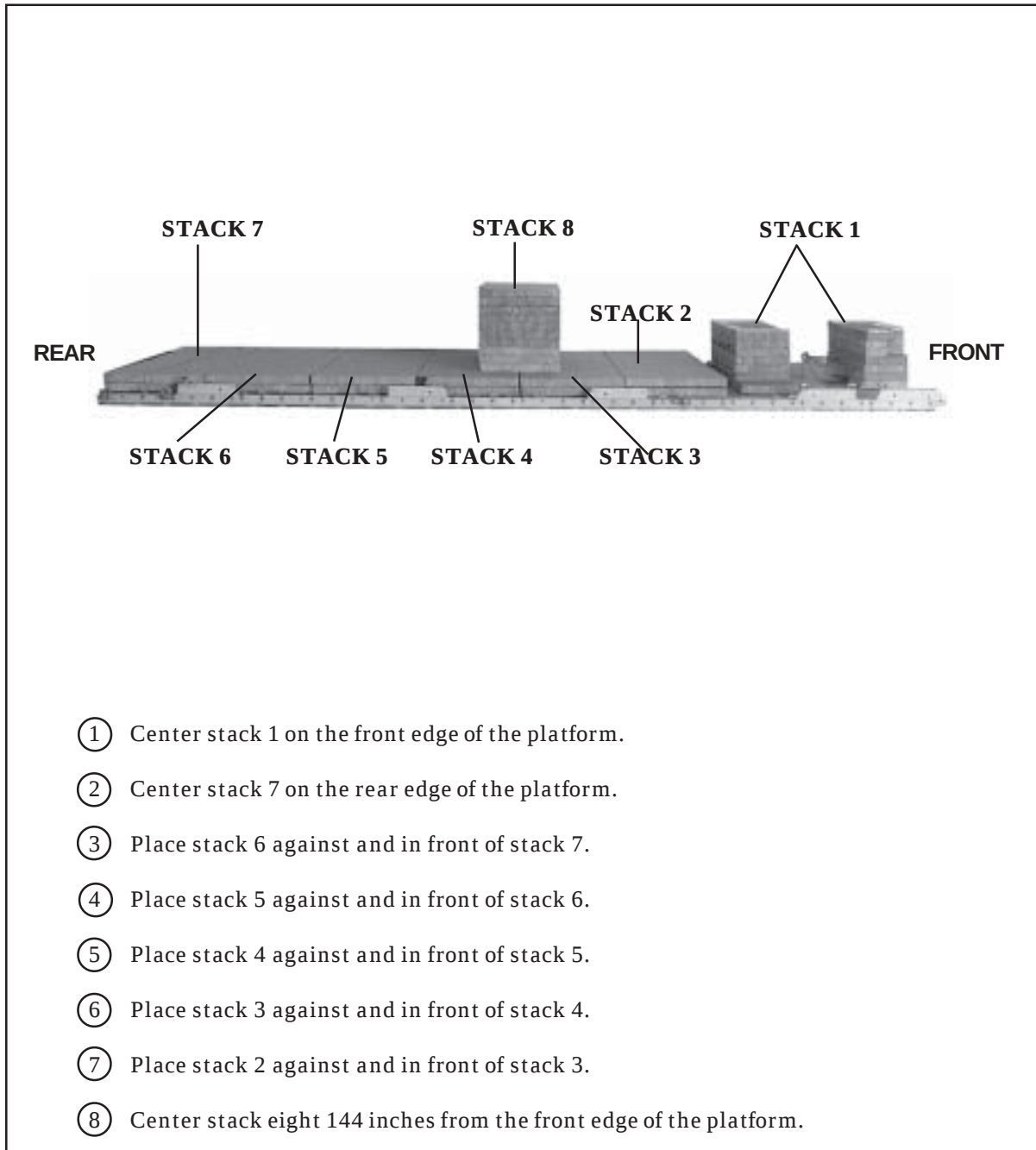


Figure 3-4. Honeycomb Stacks Positioned

BUILDING THE EQUIPMENT HOSE BOX

3-5. Build the equipment hose box as shown in Figure 3-5.

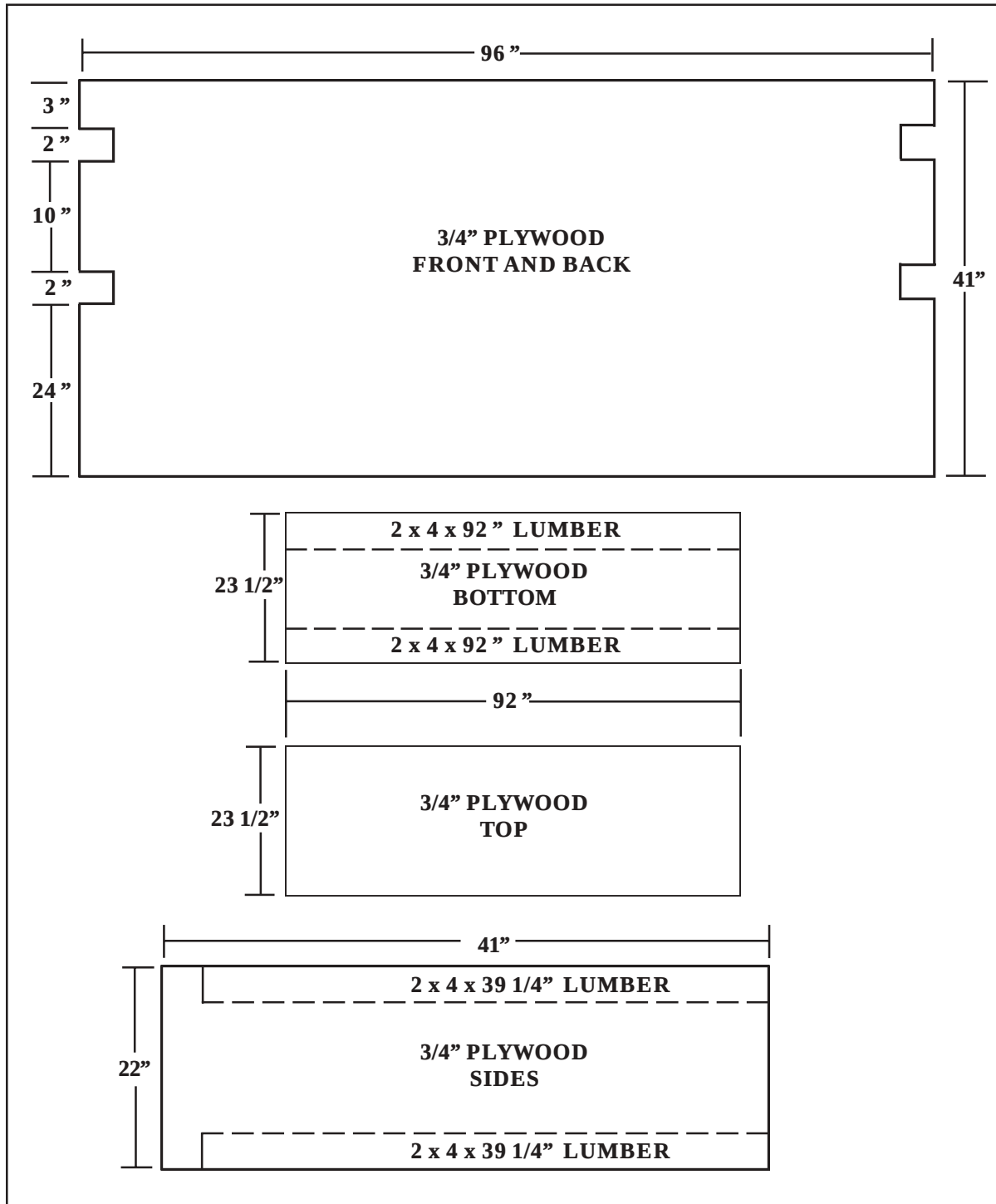
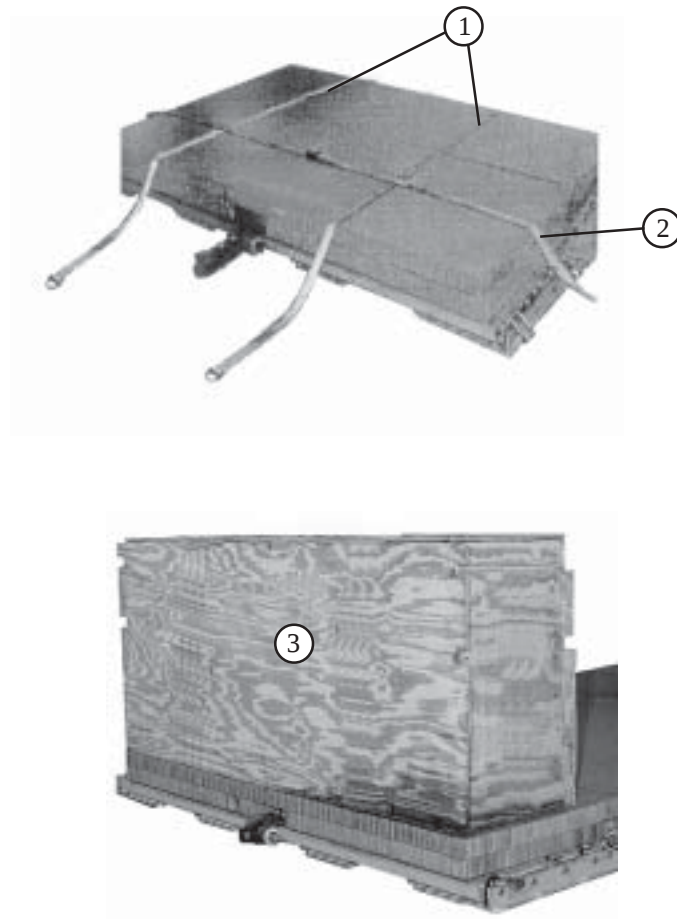


Figure 3-5. Equipment Hose Box Built

POSITIONING EQUIPMENT HOSE BOX

3-6. Position the equipment hose box on the platform as shown in Figure 3-6.

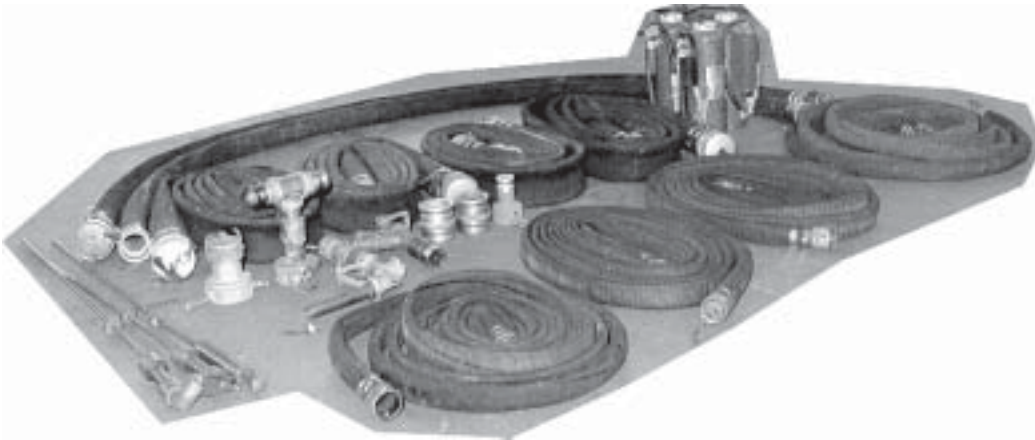


- ① Position two 15-foot lashings across honeycomb stack 7 approximately 16 inches from the outside edges.
- ② Center a 30-foot lashing lengthwise across honeycomb stack 7.
- ③ Position the equipment hose box on the rear edge of the platform.

Figure 3-6. Equipment Hose Box Positioned on Platform

STORING EQUIPMENT IN EQUIPMENT HOSE BOX

3-7. Store equipment in the equipment hose box on the platform as shown in Figure 3-7.



Item Description	Quantity
25-foot, 4-inch hose	4
Aircraft nozzle	1
Elbow coupler	1
2-inch to 3-inch adapter	2
10-foot, 3-inch hose	2
3-inch to 4-inch adapter	2
4-inch to 2-inch reducer	1
WYE adapter	1
50-foot, 2-inch hose	4
Open port nozzle	1
Grounding rod	3

- ① Place a 91-by 23-inch piece of honeycomb in the bottom of the equipment hose box.
- ② Wrap all metal fittings in cellulose wadding. Place all items in the equipment hose box.
- ③ Secure the equipment hose box top with eightpenny nails. Secure the equipment hose box with lashings installed in Figure 3-6.

Figure 3-7. Equipment Hose Box Positioned on Platform

LASHING EQUIPMENT HOSE BOX TO PLATFORM

3-8. Lash the equipment hose box to the platform as shown in Figures 3-8 and 3-9.

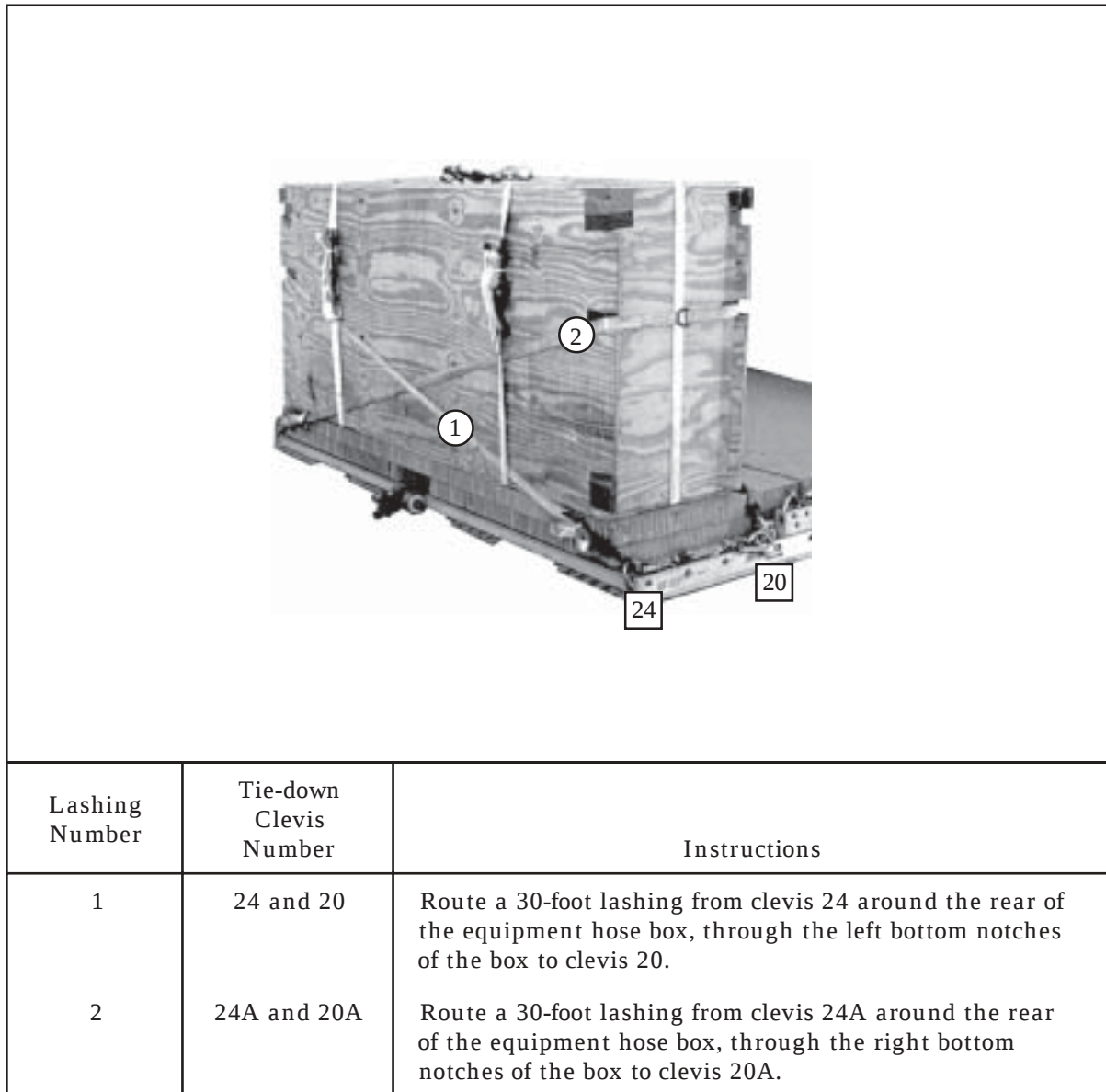
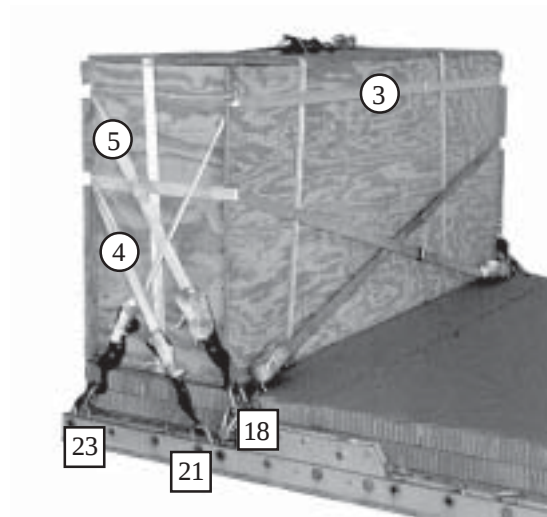


Figure 3-8. Lashings 1 and 2 Installed



Lashing Number	Tie-down Clevis Number	Instructions
3	23 and 23A	Route a 15-foot lashing through its own D-ring on clevis 23A, around the front top cutouts and load bind on clevis 23.
4	21 and 21A	Route a 15-foot lashing through its own D-ring on clevis 21A, around the rear bottom cutouts and load bind on clevis 21.
5	18 and 18A	Route a 30-foot lashing through the rear top notches of the equipment hose box. Ensure the lashings are routed under the load binders on the rear of the box. Load bind to clevises 18 and 18A.

Figure 3-9. Lashings 3 through 5 Installed

PREPARING AND POSITIONING FUEL SEPARATOR

3-9. Prepare and position the fuel separator as shown in Figure 3-10.

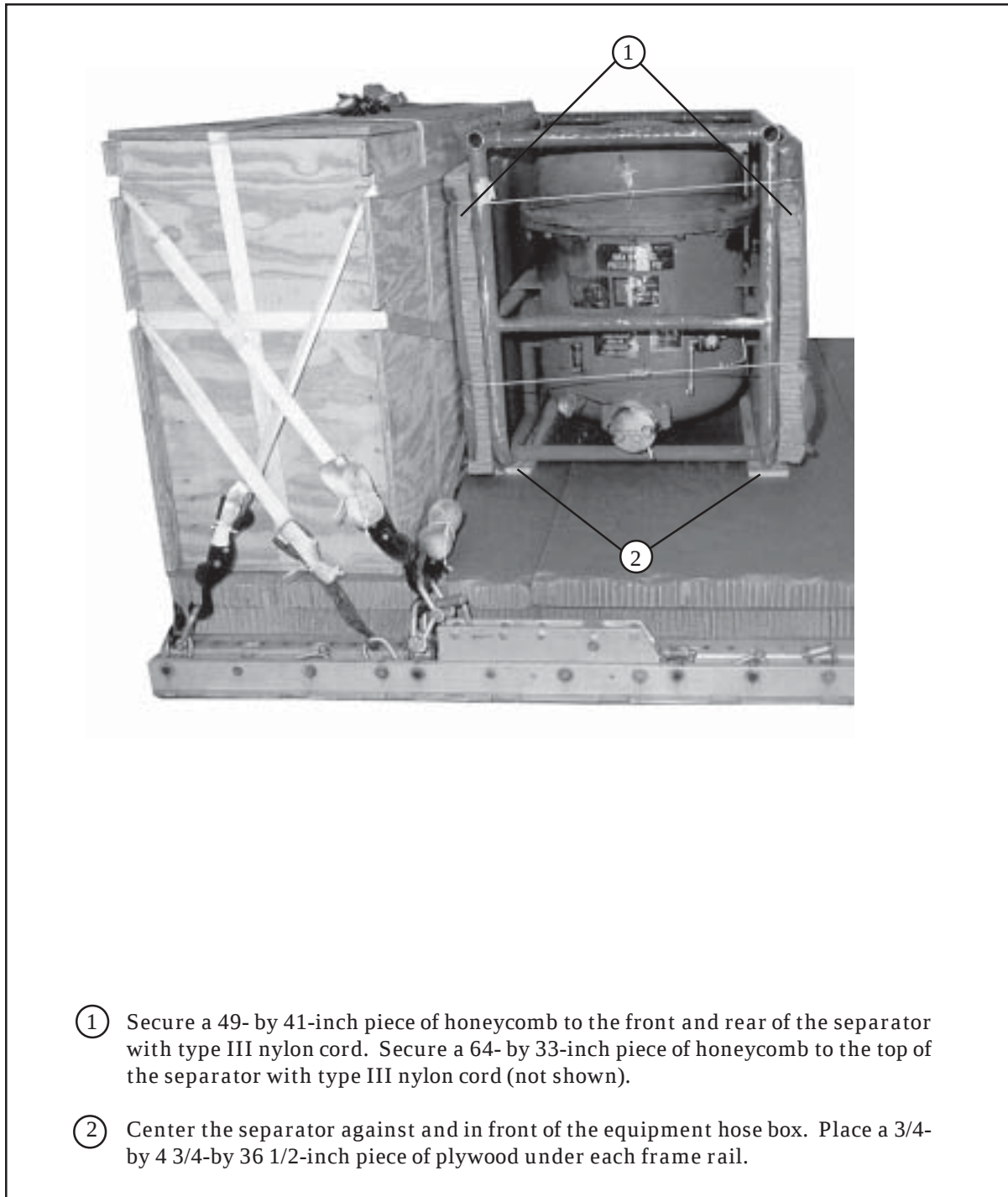
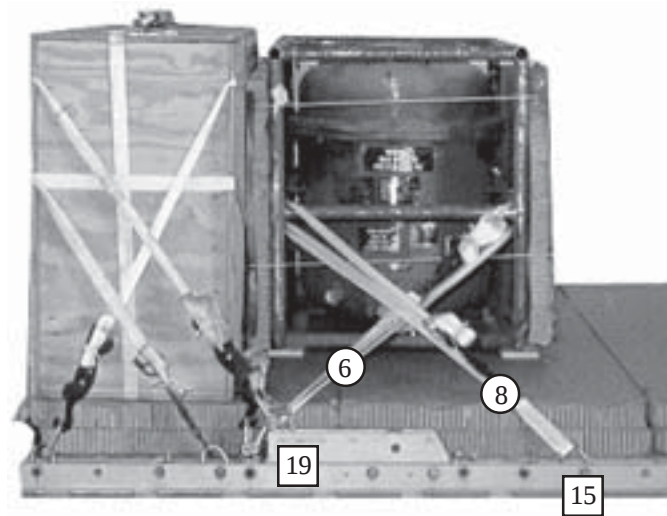


Figure 3-10. Fuel Separator Prepared and Positioned

LASHING FUEL SEPARATOR TO PLATFORM

3-10. Lash the fuel separator to the platform as shown in Figure 3-11.



Lashing Number	Tie-down Clevis Number	Instructions
6	19	Route a 15-foot lashing around the front right middle cross member.
7	19A	Route a 15-foot lashing around the front left middle cross member.
8	15	Route a 15-foot lashing around the right rear middle cross member.
9	15A	Route a 15-foot lashing around the left rear middle cross member.

Figure 3-11. Lashings 6 through 9 Installed

POSITIONING AND LASHING THE DRUMS

3-11. Position and lash the fuel drums to the platform as shown in Figure 3-12 and 3-13.

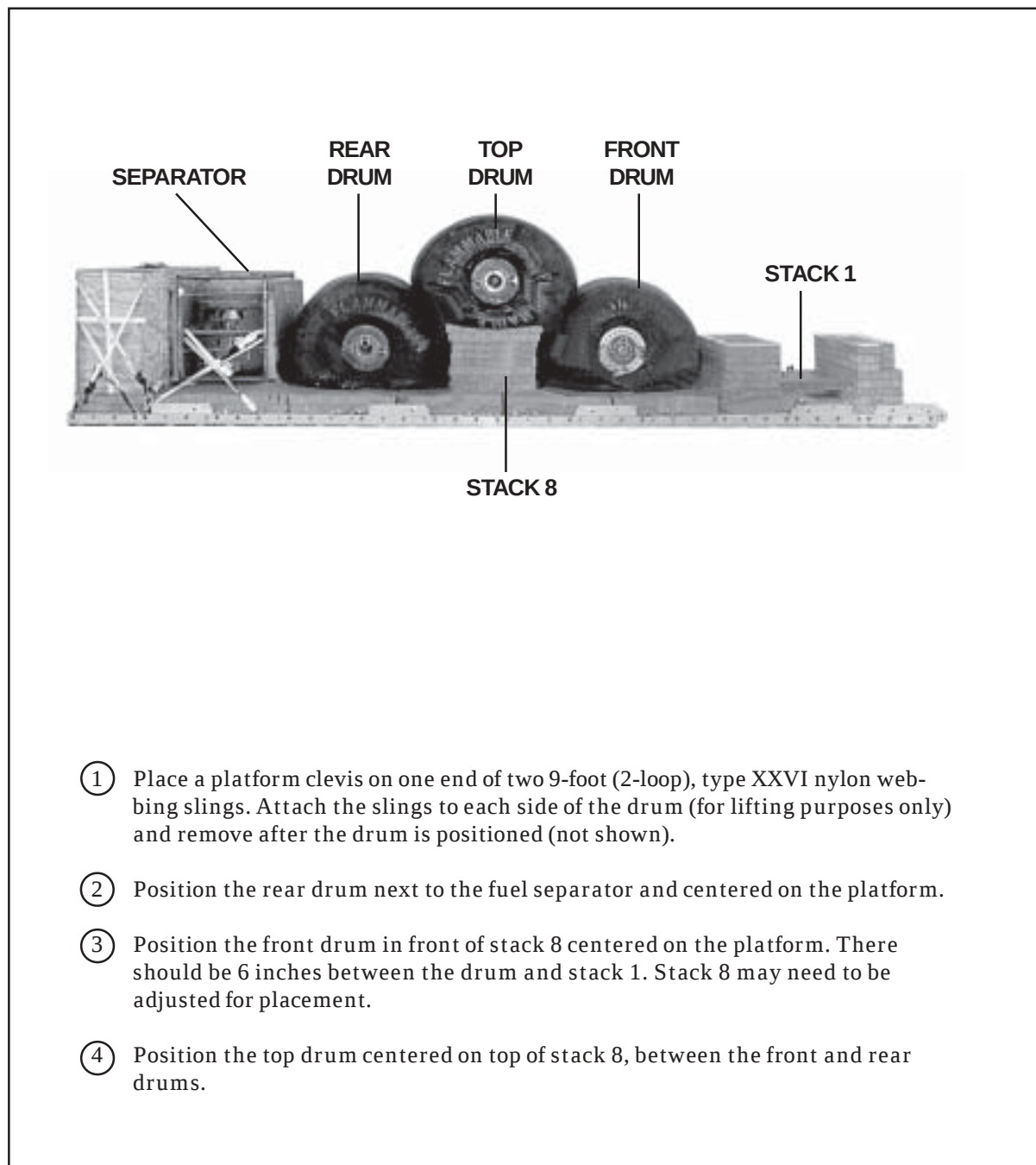


Figure 3-12. Fuel Drums Positioned

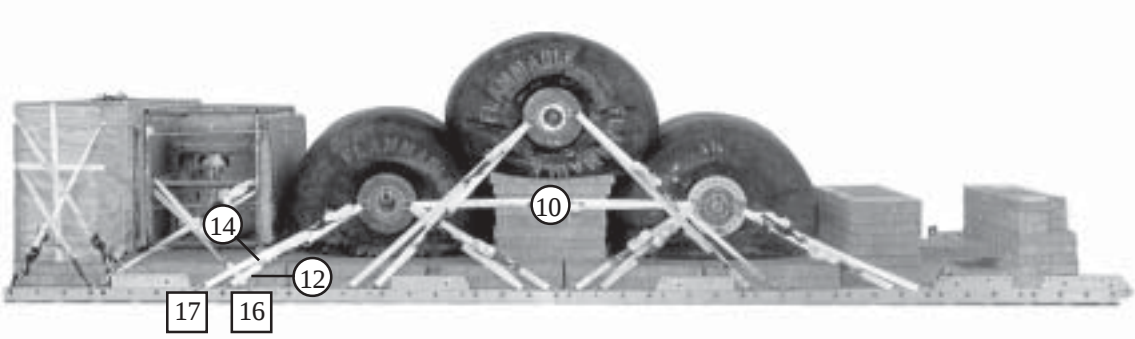
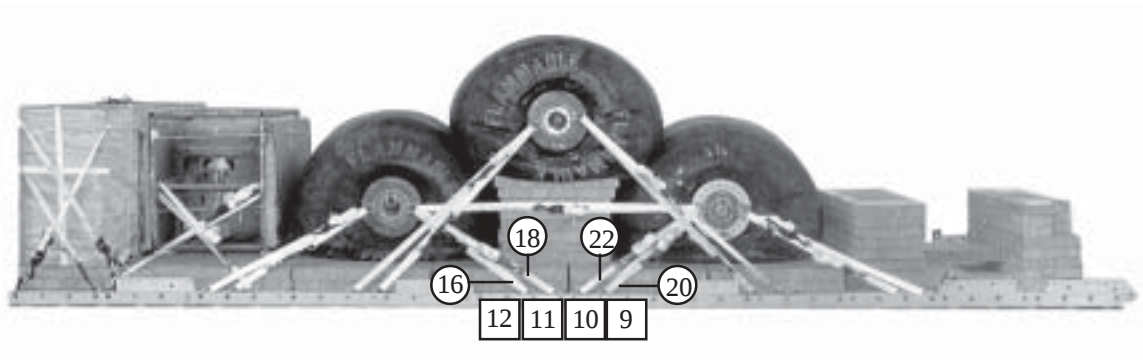
		
Lashing Number	Tie-down Clevis Number	Instructions
10		Route a lashing from the front shackle of the rear drum to the rear shackle of the front drum on the right side.
11		Route a lashing from the front shackle of the rear drum to the rear shackle of the front drum on the left side.
12	16	Route a lashing through the right rear shackle of the rear drum.
13	16A	Route a lashing through the left rear shackle of the rear drum.
14	17	Route a lashing through the right rear shackle of the rear drum.
15	17A	Route a lashing through the left rear shackle of the rear drum.

Figure 3-13. Lashings 10 through 35 Installed



Lashing Number	Tie-down Clevis Number	Instructions
16	12	Route a lashing through the right front shackle of the rear drum.
17	12A	Route a lashing through the left front shackle of the rear drum.
18	11	Route a lashing through the right front shackle of the rear drum.
19	11A	Route a lashing through the left front shackle of the rear drum.
20	9	Route a lashing through the right rear shackle of the front drum.
21	9A	Route a lashing through the left rear shackle of the front drum.
22	10	Route a lashing through the right rear shackle of the front drum.
23	10A	Route a lashing through the left rear shackle of the front drum.

Figure 3-13. Lashings 10 through 35 Installed (continued)

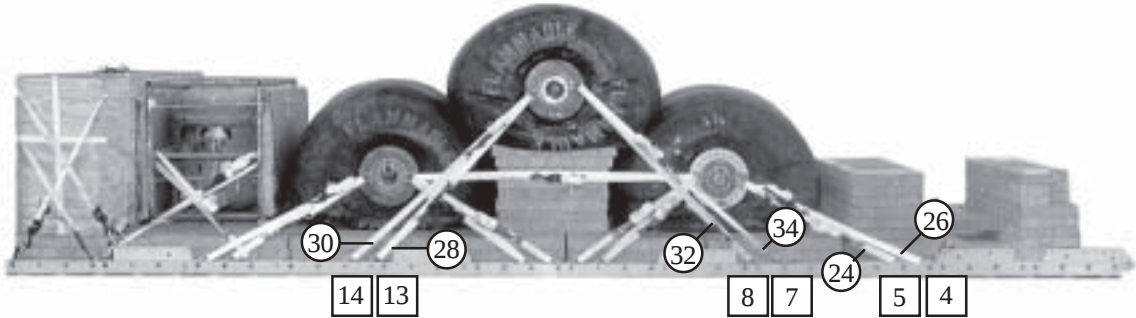
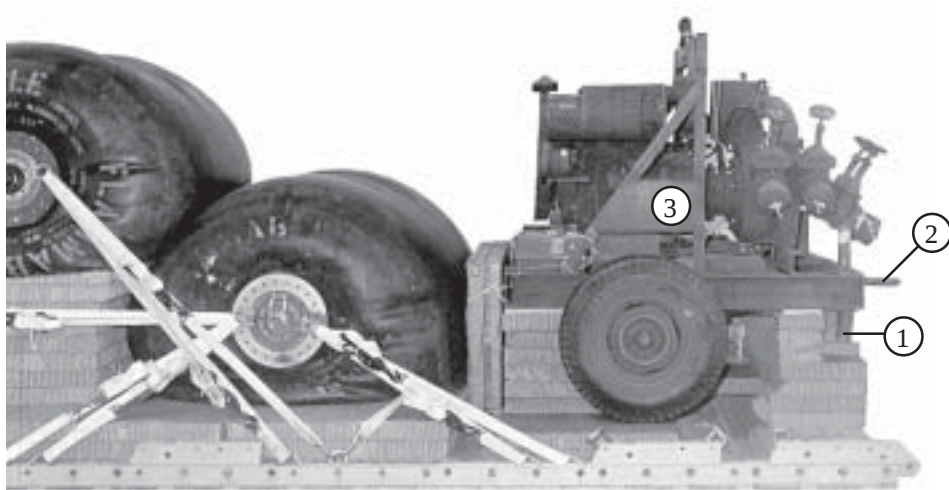
		
Lashing Number	Tie-down Clevis Number	Instructions
24	5	Route a lashing through the right front shackle of the front drum.
25	5A	Route a lashing through the left front shackle of the front drum.
26	4	Route a lashing through the right front shackle of the front drum.
27	4A	Route a lashing through the left front shackle of the front drum.
28	13	Route a lashing through the right rear shackle of the top drum.
29	13A	Route a lashing through the left rear shackle of the top drum.
30	14	Route a lashing through the right rear shackle of the top drum.
31	14A	Route a lashing through the left rear shackle of the top drum.
32	8	Route a lashing through the right front shackle of the top drum.
33	8A	Route a lashing through the left front shackle of the top drum.
34	7	Route a lashing through the right front shackle of the top drum.
35	7A	Route a lashing through the left front shackle of the top drum.

Figure 3-13. Lashings 10 through 35 Installed (continued)

PREPARING AND POSITIONING THE PUMP

3-12. Prepare the pump according to paragraph 2-5 and as shown in Figure 2-8. Position the load as shown in Figure 3-14.

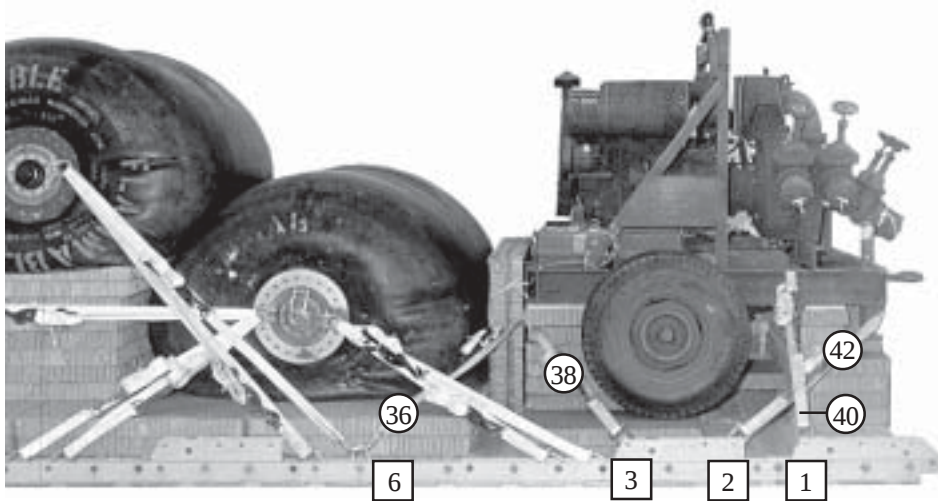


- ① Raise the legs and secure with the pins.
- ② Retract the lunette.
- ③ Position the pump on stack 1 and align the front frame edge with the front edge of the platform.
- ④ Pad the tie-down points with cellulose wadding and tape (not shown).

Figure 3-14. Pump Prepared and Positioned on Platform

LASHING PUMP TO THE PLATFORM

3-13. Lash the pump to the platform as shown in Figure 3-15.

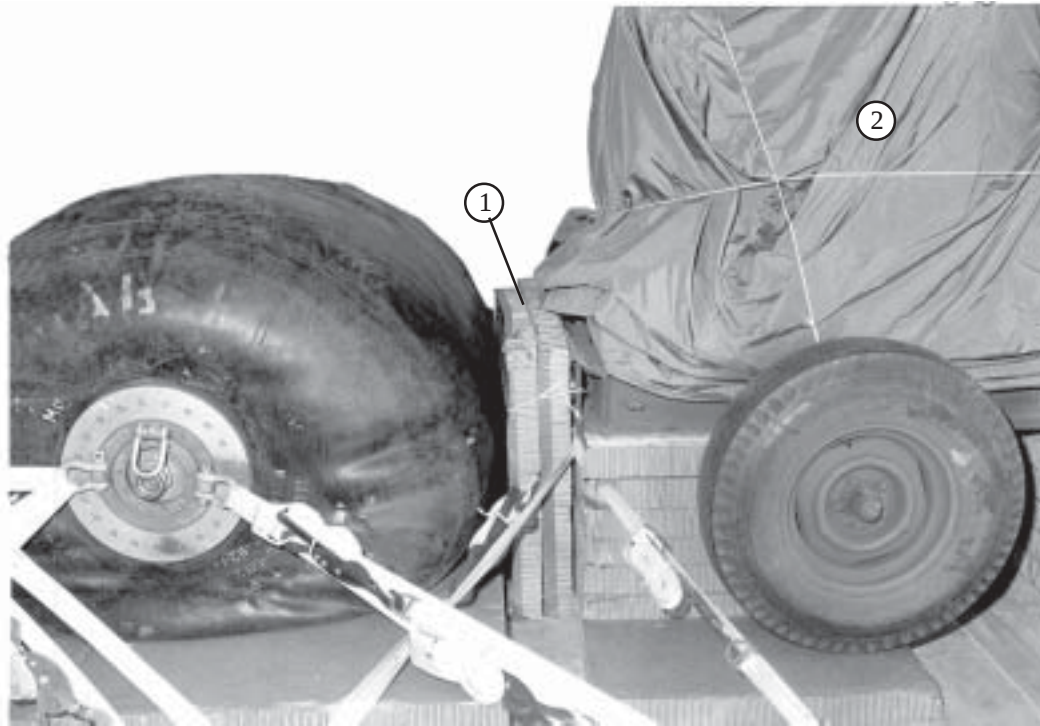


Lashing Number	Tie-down Clevis Number	Instructions
36	6	Route a lashing through the right rear tie-down point.
37	6A	Route a lashing through the left rear tie-down point.
38	3	Route a lashing through the right rear tie-down point.
39	3A	Route a lashing through the left rear tie-down point.
40	2	Route a lashing through the right front tie-down point.
41	2A	Route a lashing through the left front tie-down point.
42	1	Route a lashing around the right side frame.
43	1A	Route a lashing around the left side frame.

Figure 3-15. Lashings 36 through 43 Installed

COVERING THE PUMP

3-14. Place a canvas cover over the pump as shown in Figure 3-16.



- ① Place two pieces of 48- by 28-inch honeycomb between the pump and the drum. Secure the honeycomb to the pump with type III nylon cord.
- ② Cover the pump with a canvas cover and secure the cover with type III nylon cord.

Figure 3-16. Pump Covered and Secured

INSTALLING SUSPENSION SLINGS AND SAFETY TIES

3-15. Install suspension slings and safety ties as shown in Figure 3-17.

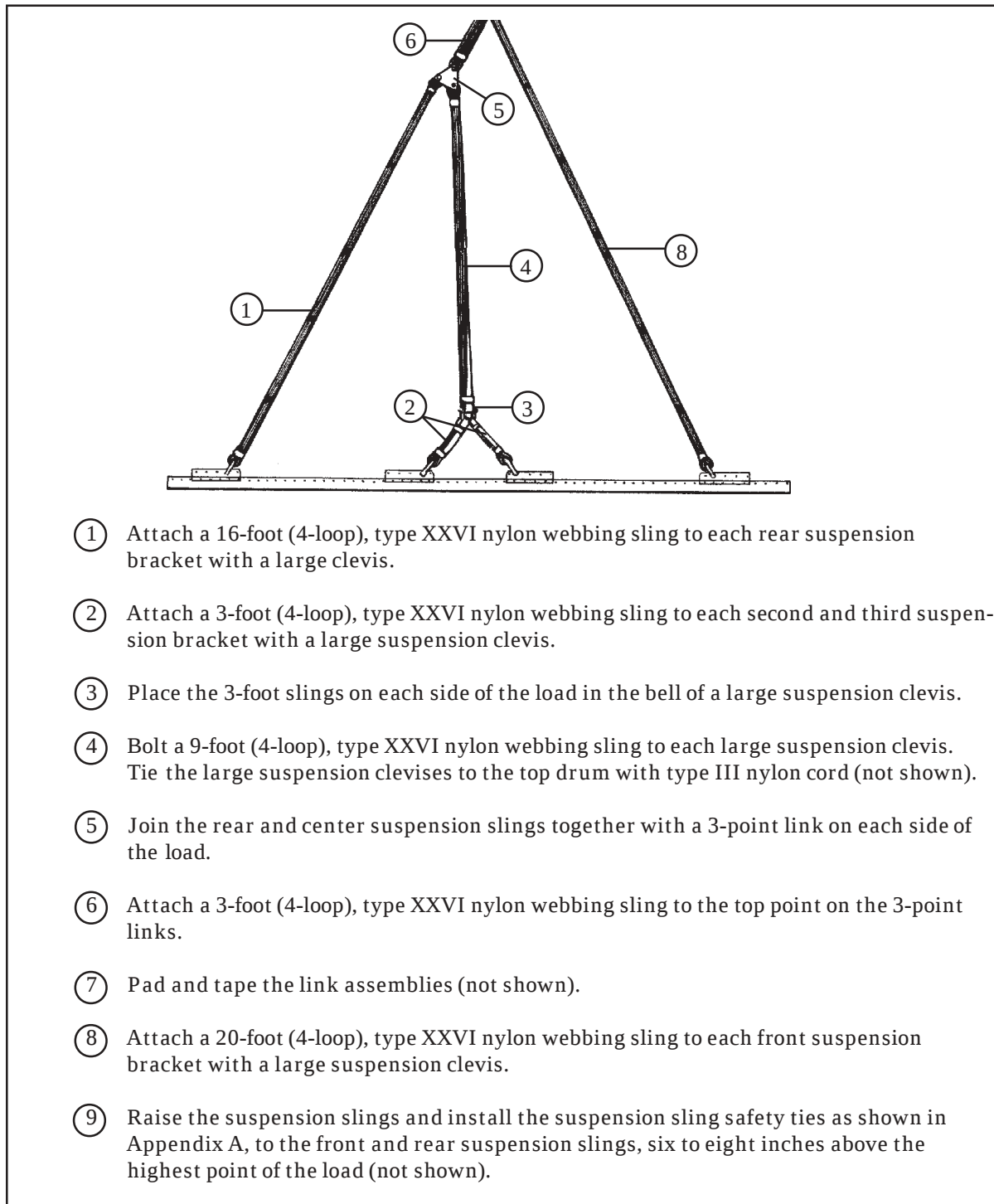


Figure 3-17. Suspension Slings and Safety Ties Installed

BUILDING AND POSITIONING PARACHUTE STOWAGE PLATFORM

3-16. Build and stow the parachute stowage platform as shown in Figure 3-18.

Align the rear edge of the stowage platform on the rear edge of the box.

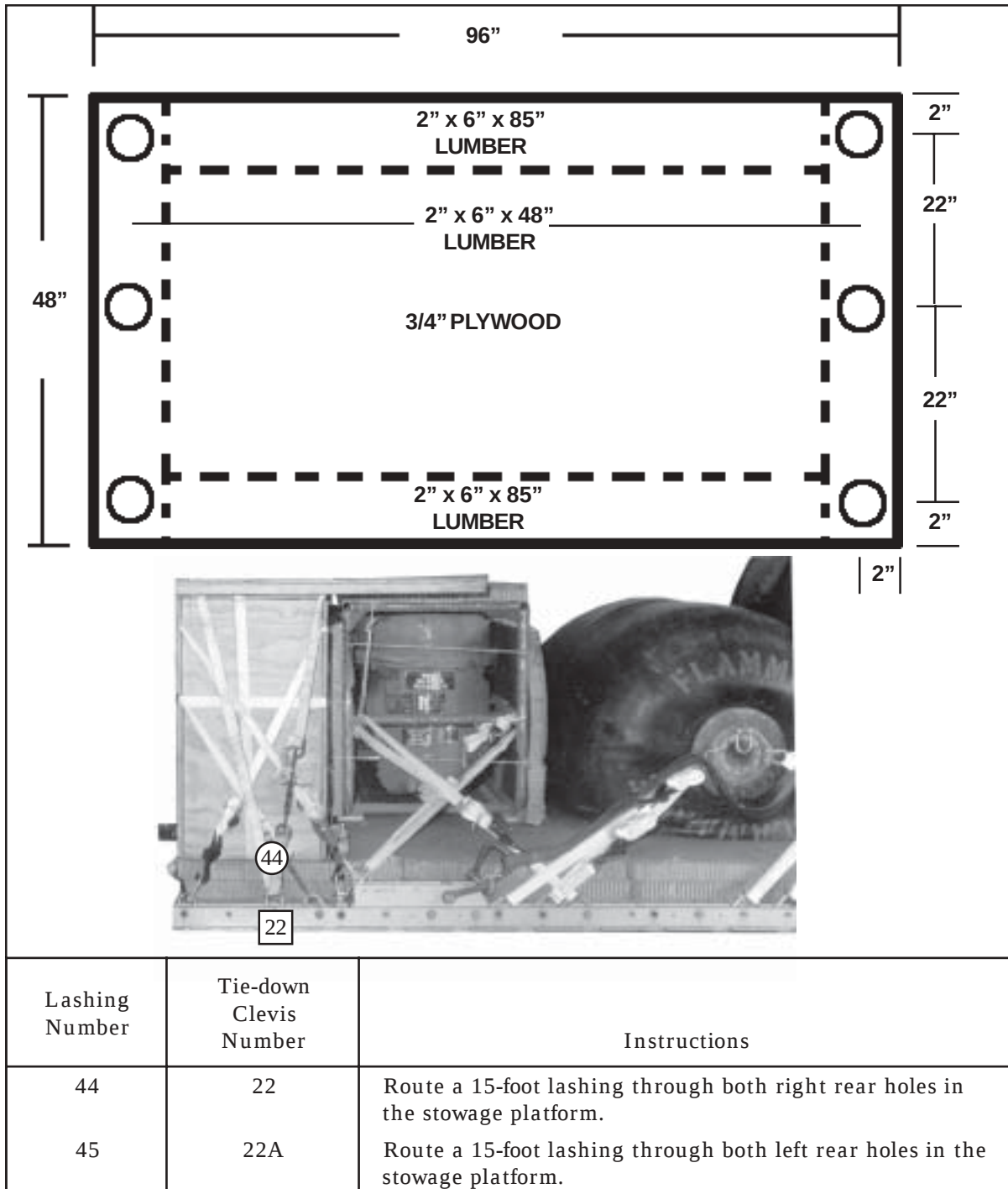
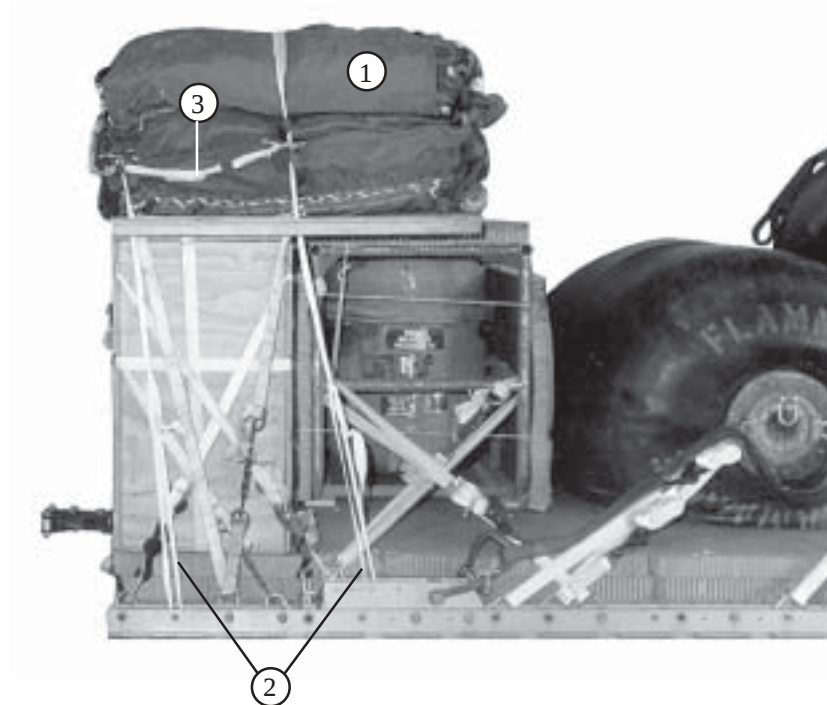


Figure 3-18. Parachute Stowage Platform Built and Positioned

PREPARING AND STOWING CARGO PARACHUTES

3-17. Prepare and stow four G-11 cargo parachutes as shown in Figure 3-19.



- ① Prepare and stow four G-11 cargo parachutes according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
- ② Restrain the parachutes according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 by using bushings 47 and 47A on the platform and bushings 3 and 3A on the rear suspension link.
- ③ Install the multicut parachute release strap according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

Figure 3-19. Cargo Parachutes Prepared and Stowed

INSTALLING THE EXTRACTION SYSTEM

3-18. Install the extraction system as shown in Figure 3-20.

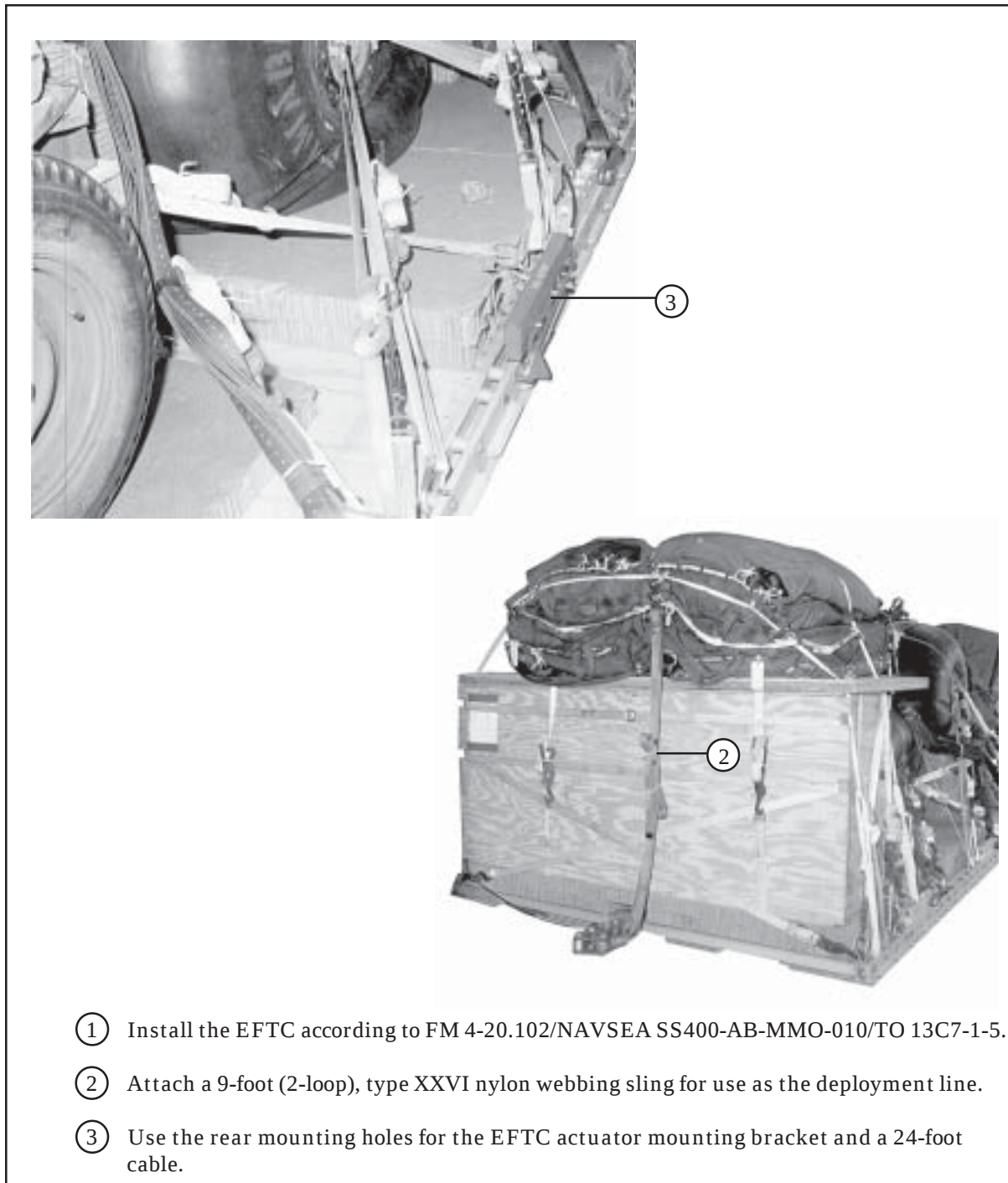
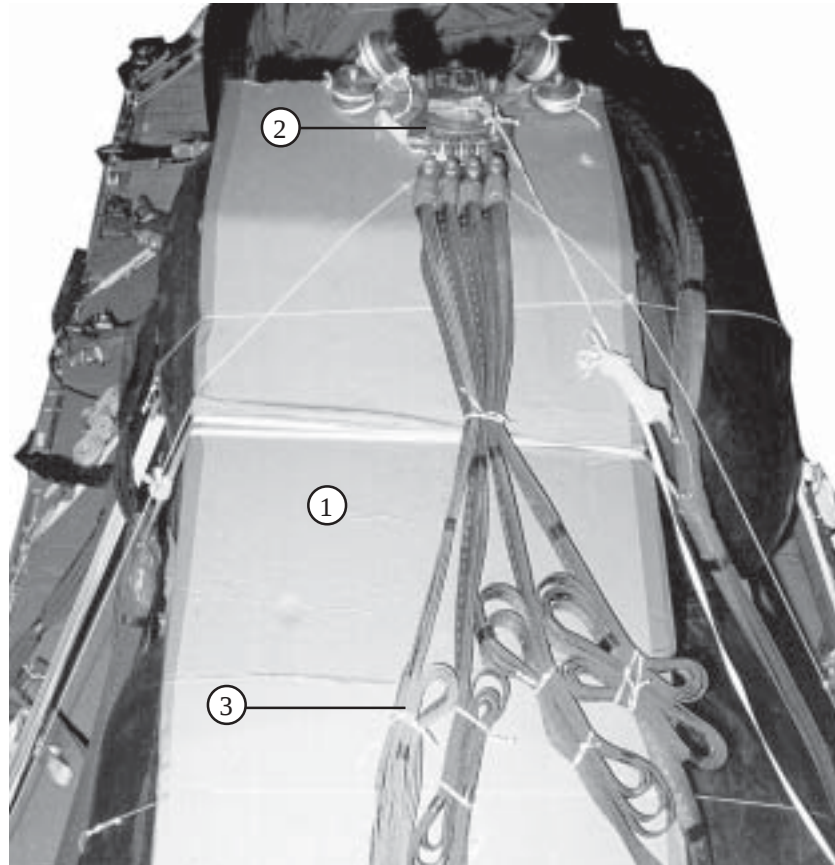


Figure 3-20. Extraction System Installed

INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

3-19. Install the M-2 cargo parachute release system as shown in Figure 3-21.



- ① Place a 96- by 24-inch piece of honeycomb from the separator to the top of the top drum. Secure the honeycomb with type III nylon cord.
- ② Place the M-2 cargo parachute release on the honeycomb placed on top of the top drum. Attach the suspension slings and the parachute riser extension to the M-2 cargo parachute release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.
- ③ S-fold and tie any slack in the suspension slings with Type I, 1/4-inch cotton webbing.

Figure 3-21. Cargo Parachute Release Installed

PLACING EXTRACTION PARACHUTE

3-20. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

3-21. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

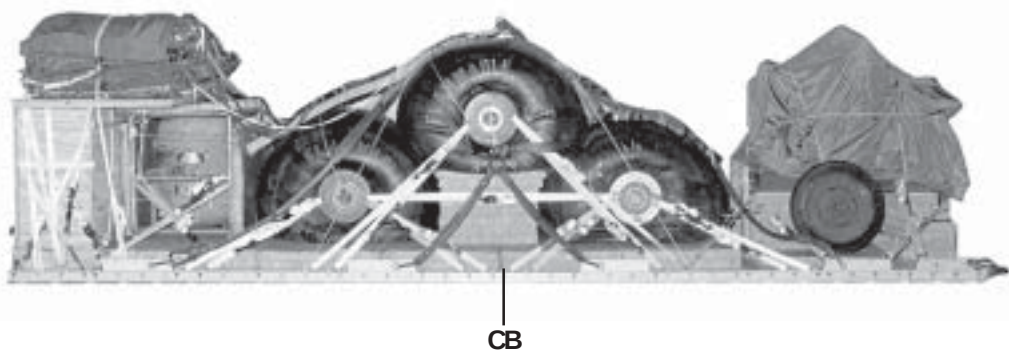
3-22. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 3-22. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

3-23. Use the equipment list in Table 3-1 to rig the load shown in Figure 3-22.

CAUTION:

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.



RIGGED LOAD DATA

Weight	19,689 pounds
Maximum Weight	21,000 pounds
Height	89 inches
Width	108 inches
Overall Length	315 inches
Overhang: Front (Tongue of Pump)	9 inches
Rear (EFTC)	18 inches
Center of Balance (CB) (from front edge of platform)	144 inches
Extraction System	EFTC

Figure 3-22. Three 500-Gallon Drums with Pump and Separator Rigged for Low-Velocity Airdrop

Table 3-1. Equipment Required for Rigging Three 500-Gallon Drums with Pump and Separator

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive, paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	9
4030-00-678-8562	Clevis, medium	6
8305-00-880-8155	Cloth coated, green, 60-inch	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5782	Coupling, airdrop, extraction force transfer with cable, 24-ft	1
1670-00-360-0328	Cover, Clevis, large	4
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
5365-00-937-0147	D-ring, heavy-duty, 10,000-lb	24
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, miniature, cutter (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add 1 for FOR DES)	2
1670-01-064-4452	Line, drogue (for DES) 60-ft (1-loop), type XXVI	1
1670-01-062-6313	Line, extraction: For C-130: 60-ft (3-loop), type XXVI	1
1670-01-107-7651	For C-141, C-5, C-17: 140-ft (3-loop), type XXVI	1
	Link Assembly:	
	Two-point:	
5306-00-435-8994	Bolt, 1-in diam, 4-in long (add 2 for DES)	(2)
5310-00-232-5165	Nut, 1-in, hexagonal (add 2 for DES)	(2)
1670-00-003-3454	Plate, side, 5 1/2-in	(2)
1670-00-003-1953	Plate, side, 3 3/4-in (for DES)	(2)
5365-00-007-3414	Spacer, large (add 2 for DES)	(2)
1670-01-307-1055	Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1
5510-00-220-6146	Lumber, 2- by 4- by 96-in:	4
5510-00-220-6148	Lumber, 2- by 6 by 96-in:	3
5315-00-010-4659	Nail, steel wire, 8d	As required

**Table 3-1. Equipment Required for Rigging Three 500-Gallon Drums with Pump and Separator
(continued)**

National Stock Number	Item	Quantity
1670-00-753-3928	Pad, energy-dissipating (honeycomb), 3- by 36- by 96-in	30 sheets
1670-01-016-7841	Parachute: Cargo: G-11B	4
1670-00-040-8135	Cargo extraction: 28-ft	1
1670-01-063-3715	Droque (for DES) 15-ft	1
1670-01-353-8425	Platform, airdrop, type V, 24-ft: Bracket assembly, coupling	(1)
1670-01-162-2372	Clevis assembly, type V	(53)
1670-01-162-2376	Extraction bracket assembly	(1)
1670-01-247-2389	Bracket, suspension	(8)
1670-01-162-2381	Tandem link assembly (Multipurpose link)	(2)
5530-00-128-4981	Plywood, 3/4-in	4 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
	Sling, cargo, airdrop	
	For suspension and lifting:	
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	6
1670-01-062-6305	9-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6308	16-ft (4-loop), type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), type XXVI nylon webbing	2
	For deployment:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-ft (3-loop), type XXVI nylon webbing	4
5340-00-040-8219	Strap, parachute release, multi-cut, comes w/ 2 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	53
8310-00-917-3945	Thread, Cotton, Ticket 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Nylon, Type VIII	As required

SECTION II - RIGGING FOUR 500-GALLON DRUMS

DESCRIPTION OF LOAD

3-24. The four collapsible drums are rigged on a 28-foot platform with five G-11 cargo parachutes. Each drum is filled with a maximum of 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The 350-GPM pump with filter/separator and hose box are accompanying loads. The total rigged load has a maximum rigged weight of 25,700 pounds with a width of 108 inches and a length of 372 inches. It has an overhang of 18 inches in the front and 9 inches in the rear. The load has a center of balance of 172 inches from the front of the platform.

- Notes:**
1. For drums filled with liquid other than water, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

3-25. Prepare a 28-foot type V airdrop platform using two tandem links, eight suspension brackets, and 68 tie-down clevises as shown in Figure 3-23.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

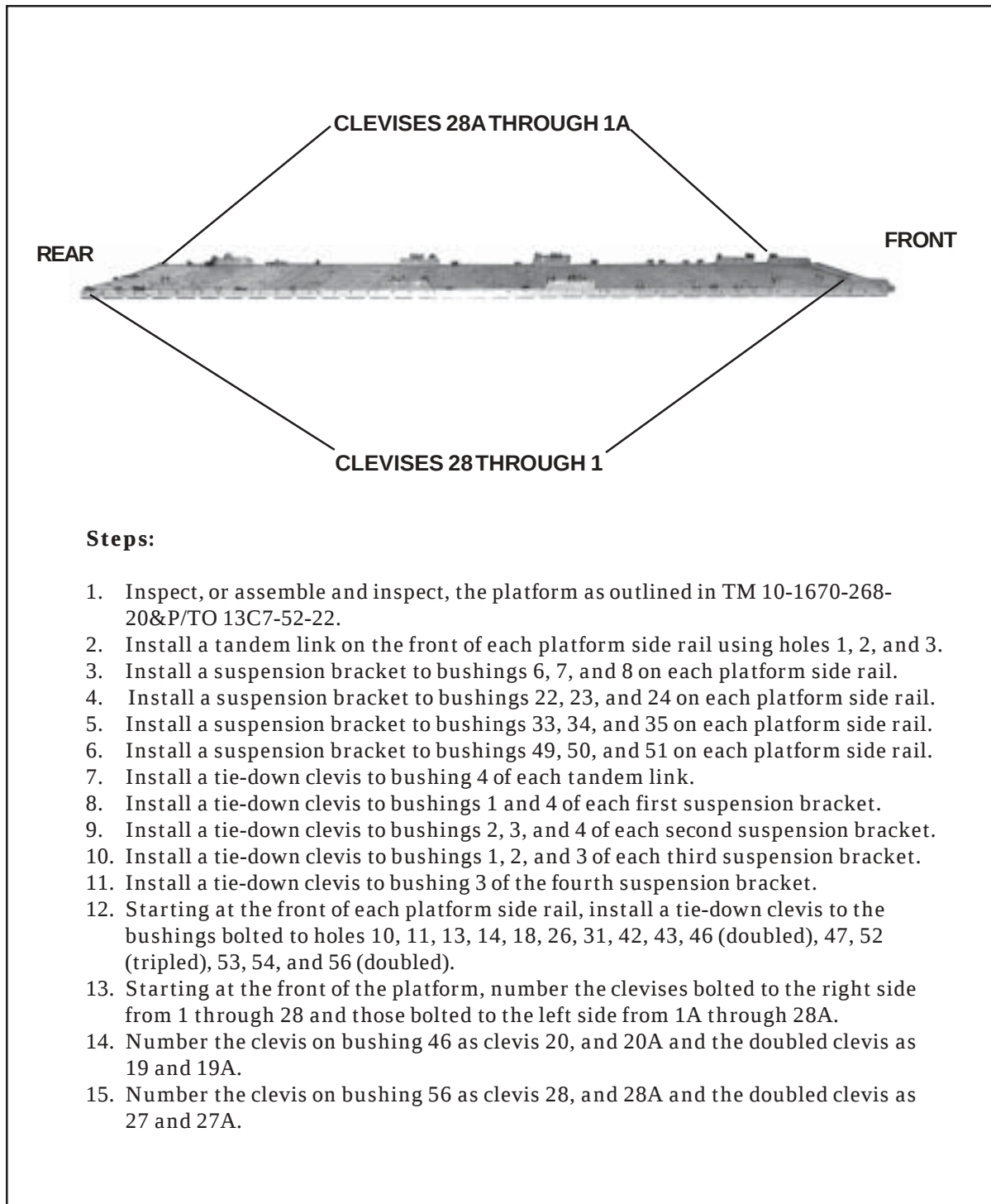


Figure 3-23. Platform Prepared

PREPARING HONEYCOMB

3-26. Build honeycomb stacks as shown in Figure 3-2 and Figures 3-24 and 3-25.

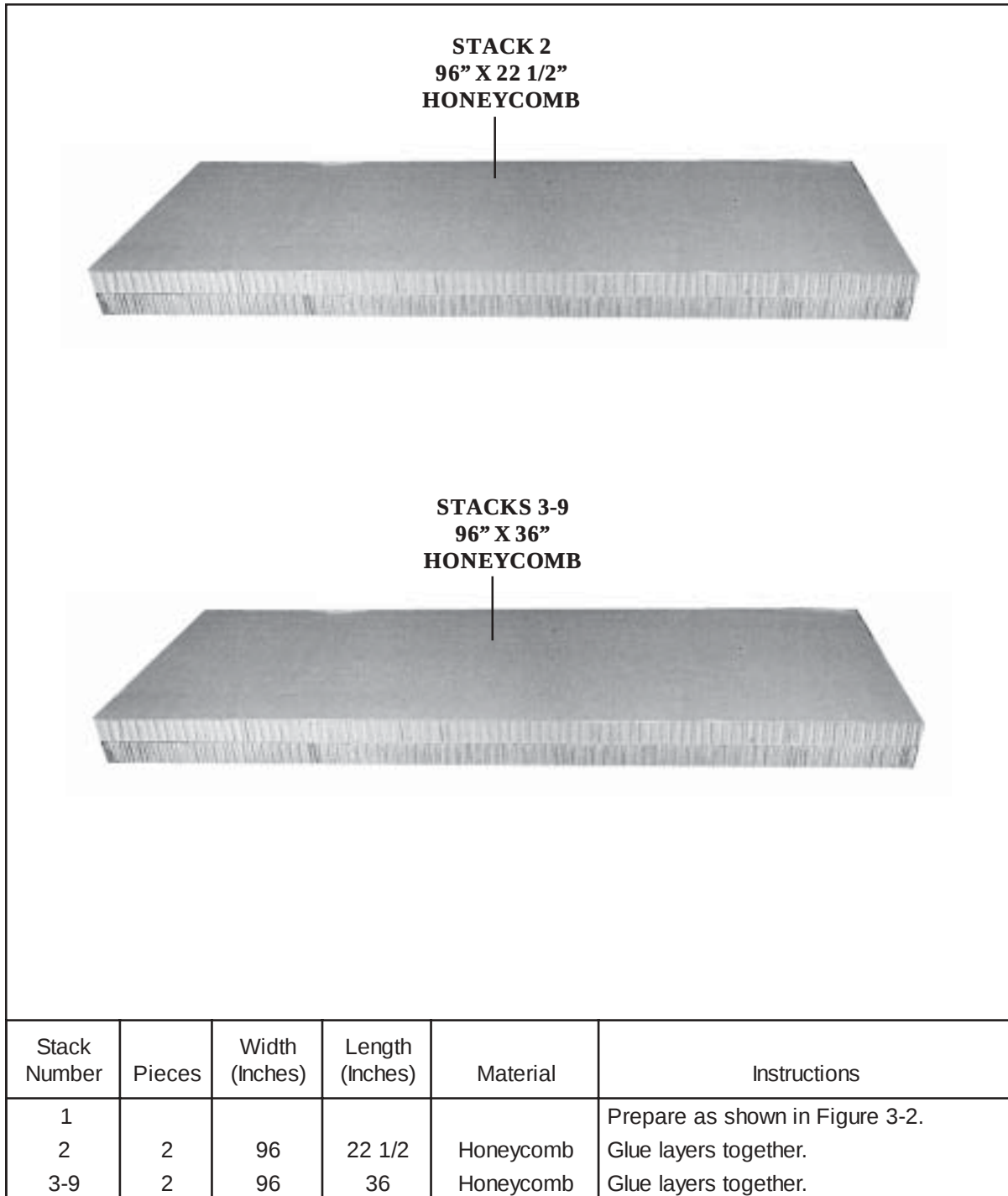


Figure 3-24. Honeycomb Stacks 1 through 9 Prepared

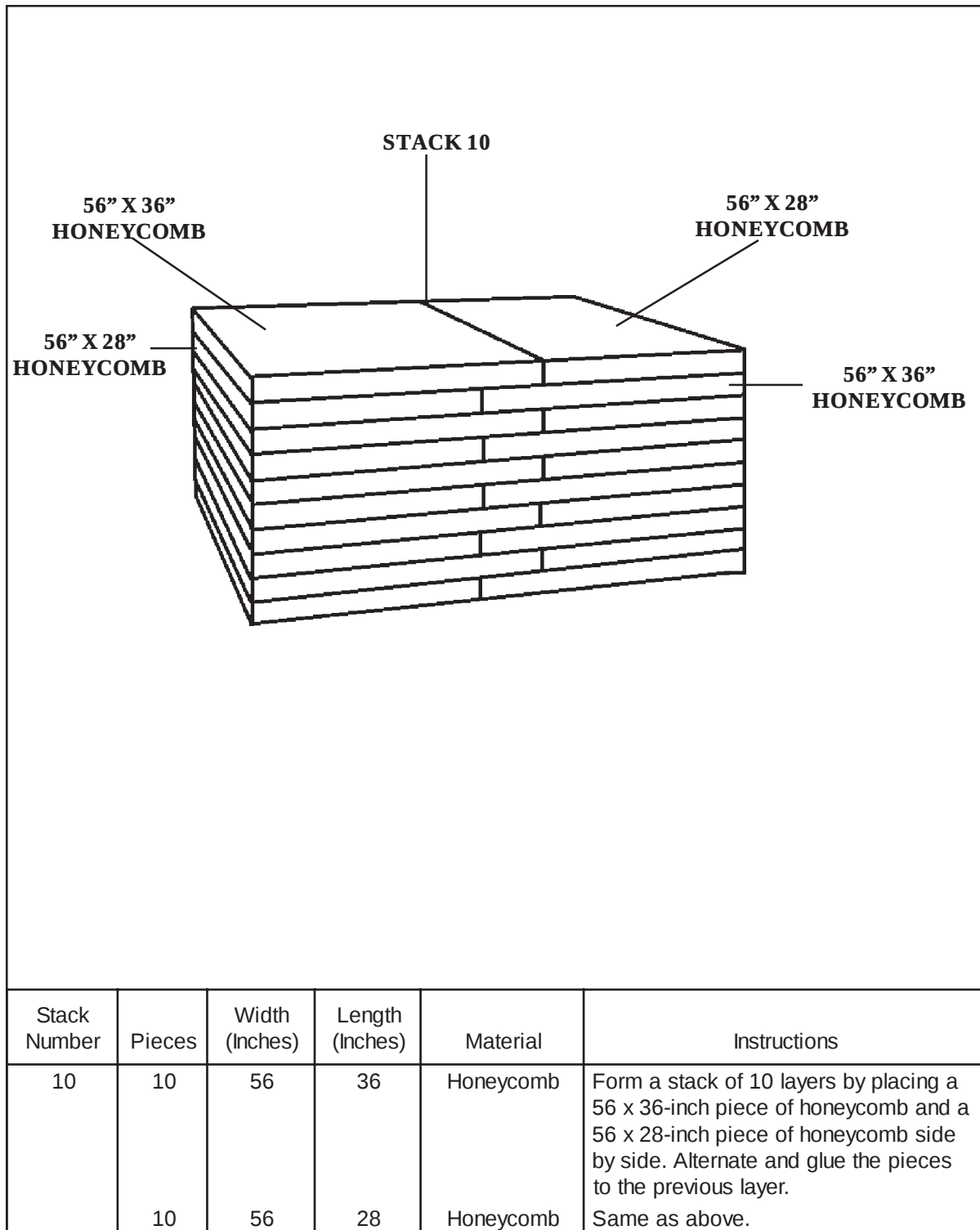


Figure 3-25. Honeycomb Stack 10 Prepared

POSITIONING HONEYCOMB STACKS

3-27. Position honeycomb stacks as shown in Figure 3-26.

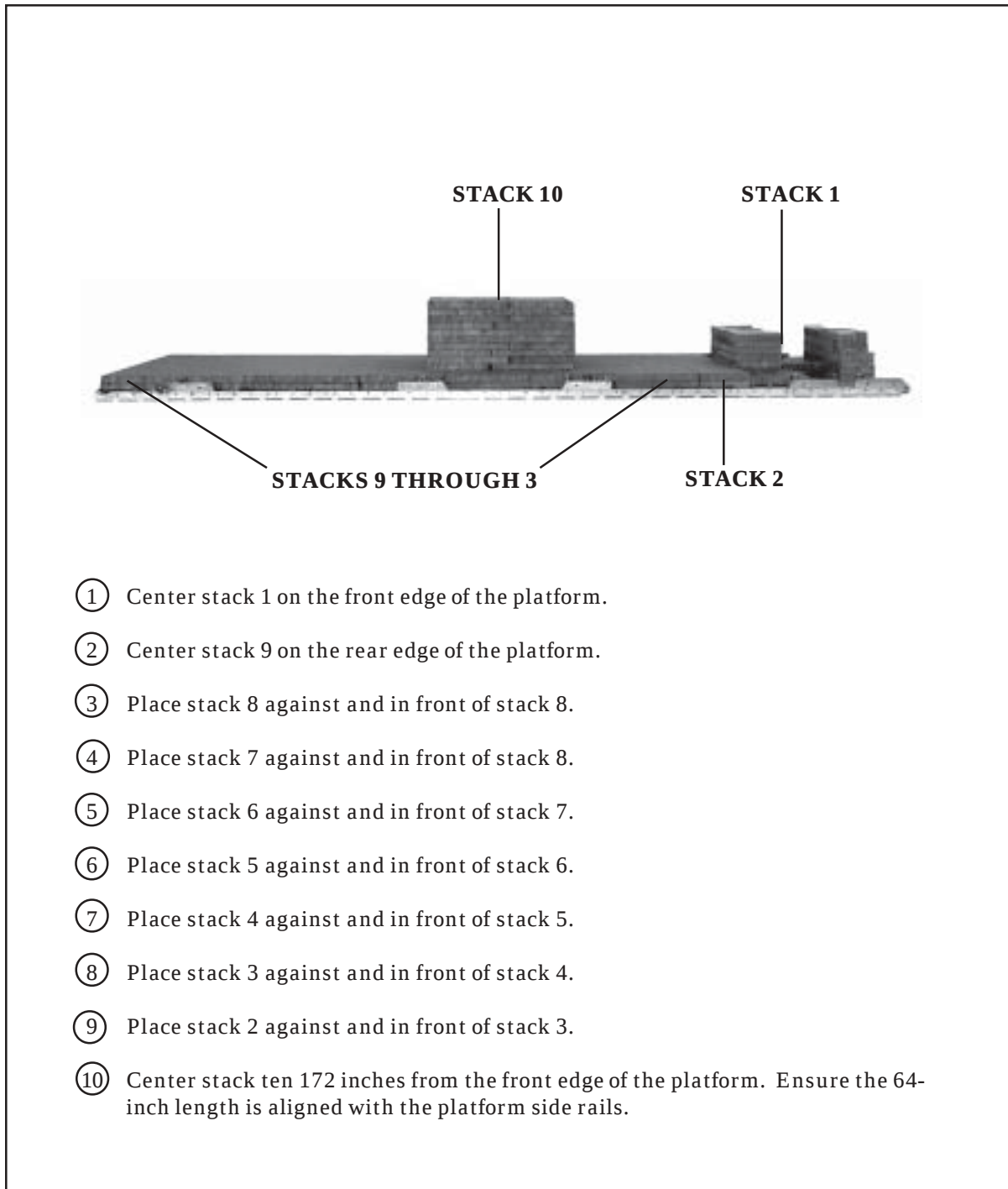


Figure 3-26. Honeycomb Stacks Positioned

BUILDING EQUIPMENT HOSE BOX

3-28. Build the equipment hose box as shown in Figure 3-5.

POSITIONING EQUIPMENT HOSE BOX

3-29. Position the equipment hose box on stack 9 as shown in Figure 3-6.

STORING EQUIPMENT IN THE EQUIPMENT HOSE BOX

3-30. Store the equipment in the equipment hose box as shown in Figure 3-7.

LASHING EQUIPMENT HOSE BOX TO PLATFORM

3-31. Lash the equipment hose box to the platform as shown in Figures 3-27 and 3-28.

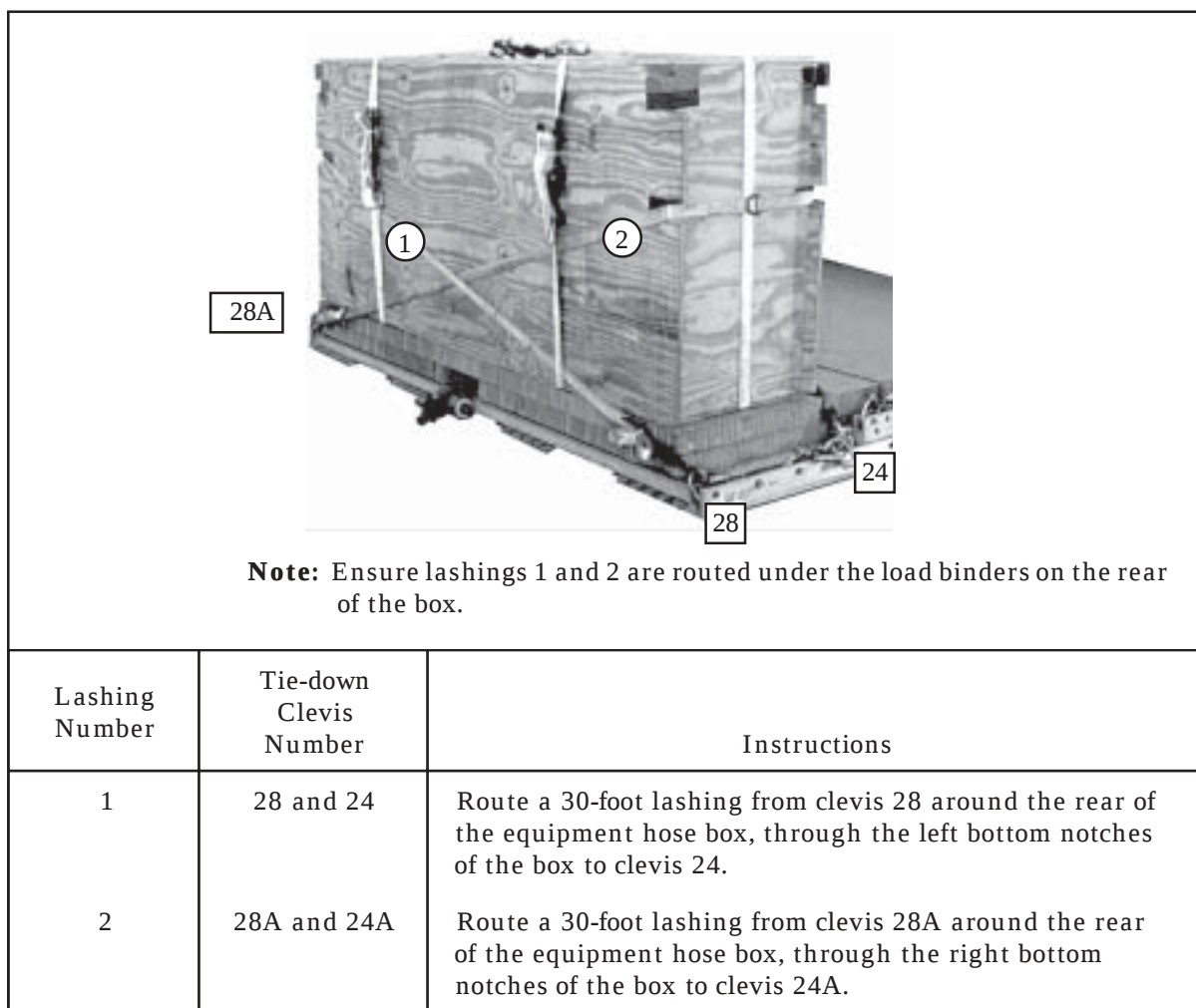
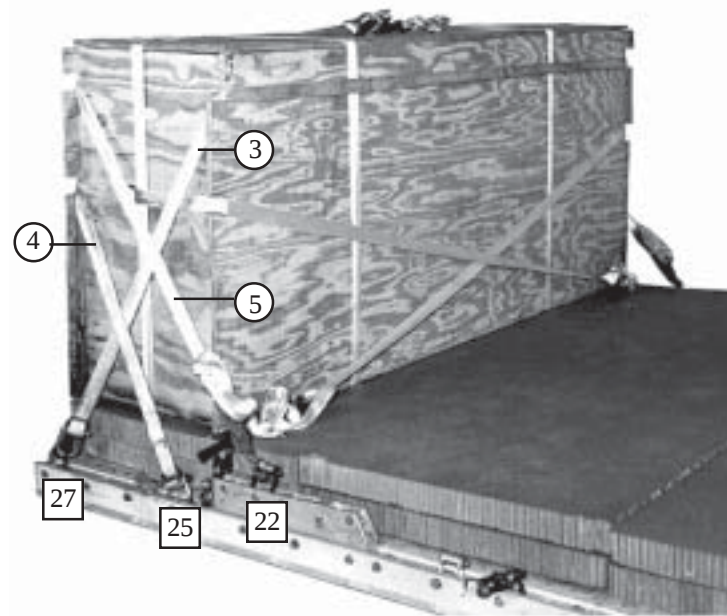


Figure 3-27. Lashings 1 and 2 Installed



Lashing Number	Tie-down Clevis Number	Instructions
3	27 and 27A	Route a 15-foot lashing through its own D-ring on clevis 27, around the front top cutouts and load bind on clevis 27A.
4	25 and 25A	Route a 15-foot lashing through its own D-ring on clevis 25, around the rear bottom cutouts and load bind on clevis 25A.
5	22 and 22A	Route a 30-foot lashing through the rear top cutouts of the equipment hose box. Ensure the lashing is routed under the load binders on the rear of the box. Load bind to clevises 22 and 22A.

Figure 3-28. Lashings 3 through 5 Installed

PREPARING AND POSITIONING FUEL SEPARATOR

3-32. Prepare and position the fuel separator as shown in Figure 3-10.

LASHING FUEL SEPARATOR TO PLATFORM

3-33. Lash the fuel separator to the platform as shown in Figure 3-29.

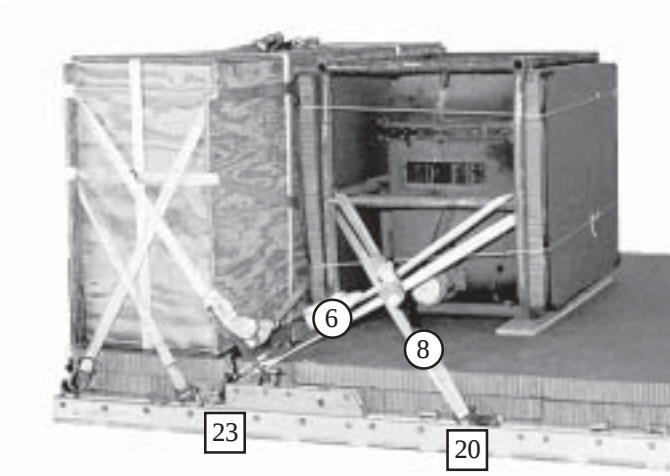
		
Lashing Number	Tie-down Clevis Number	Instructions
6	23	Route a 15-foot lashing around the front right middle cross member.
7	23A	Route a 15-foot lashing around the front left middle cross member.
8	20	Route a 15-foot lashing around the right rear middle cross member.
9	20A	Route a 15-foot lashing around the left rear middle cross member.

Figure 3-29. Lashings 6 through 9 Installed

POSITIONING AND LASHING THE DRUMS

3-34. Position and lash the fuel drums to the platform as shown in Figures 3-30 through 3-35.

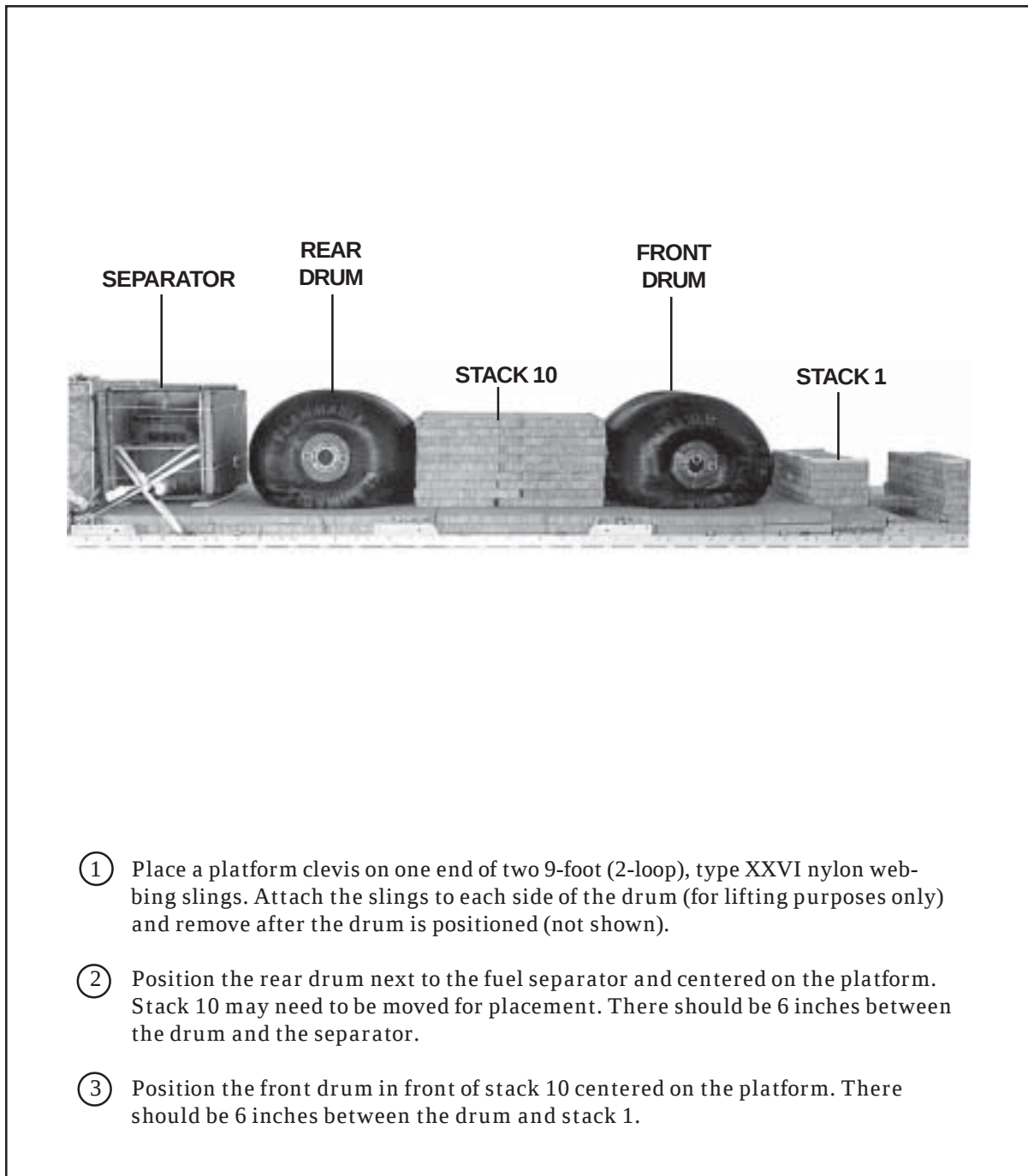


Figure 3-30. Front and Rear Drums Positioned

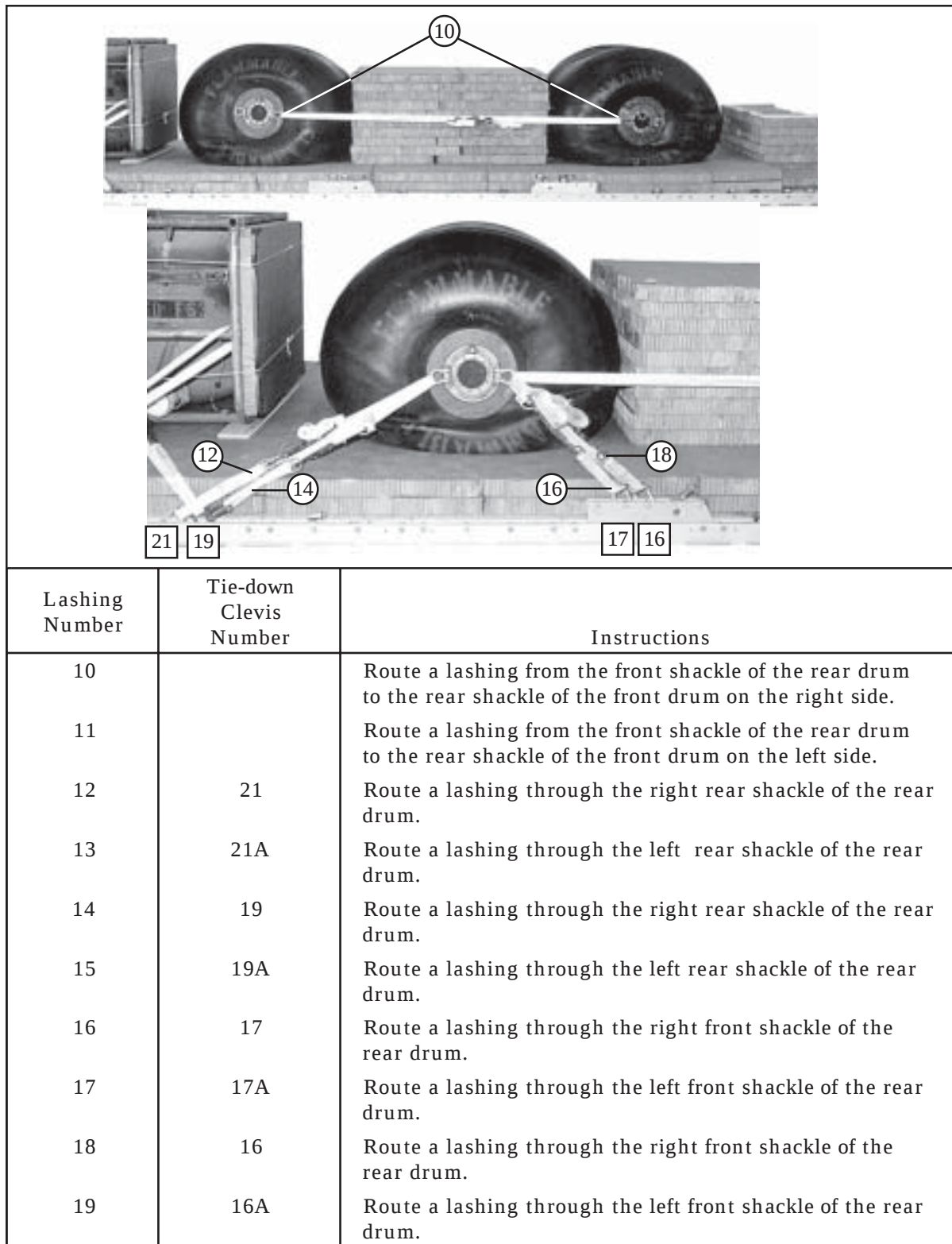
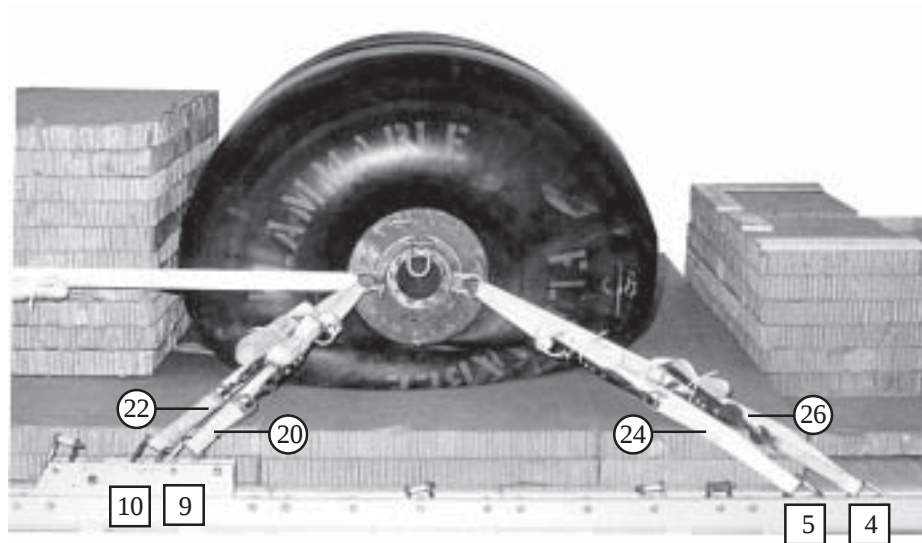
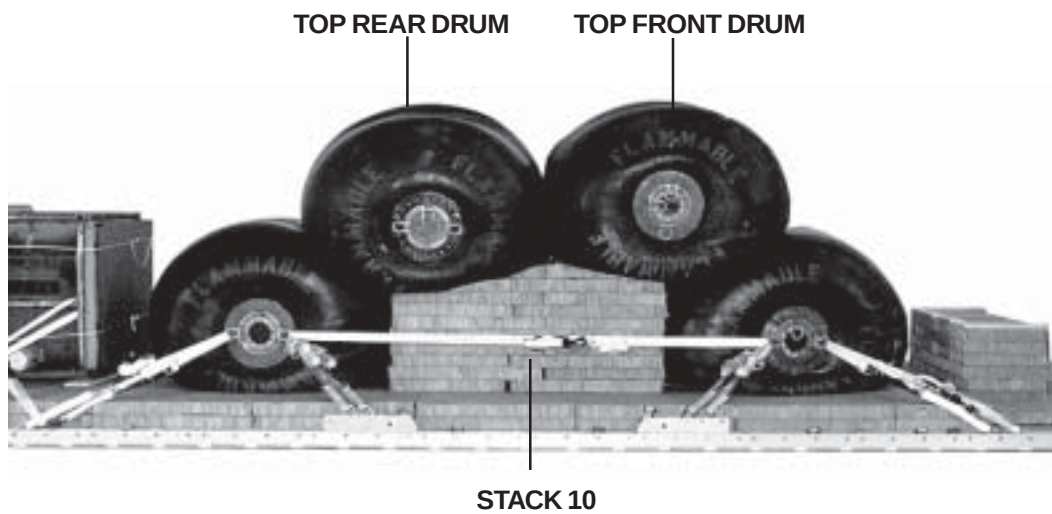


Figure 3-31. Lashings 10 through 19 Installed



Lashing Number	Tie-down Clevis Number	Instructions
20	9	Route a lashing through the right rear shackle of the front drum.
21	9A	Route a lashing through the left rear shackle of the front drum.
22	10	Route a lashing through the right rear shackle of the front drum.
23	10A	Route a lashing through the left rear shackle of the front drum.
24	5	Route a lashing through the right front shackle of the front drum.
25	5A	Route a lashing through the left front shackle of the front drum.
26	4	Route a lashing through the right front shackle of the front drum.
27	4A	Route a lashing through the left front shackle of the front drum.

Figure 3-32. Lashings 20 through 27 Installed



- ① Position the top rear drum to the rear of stack 10.
- ② Position the top front drum to the front of stack 10. Ensure each drum is equally placed on stack 10.

Figure 3-33. Top Rear and Top Front Drums Positioned

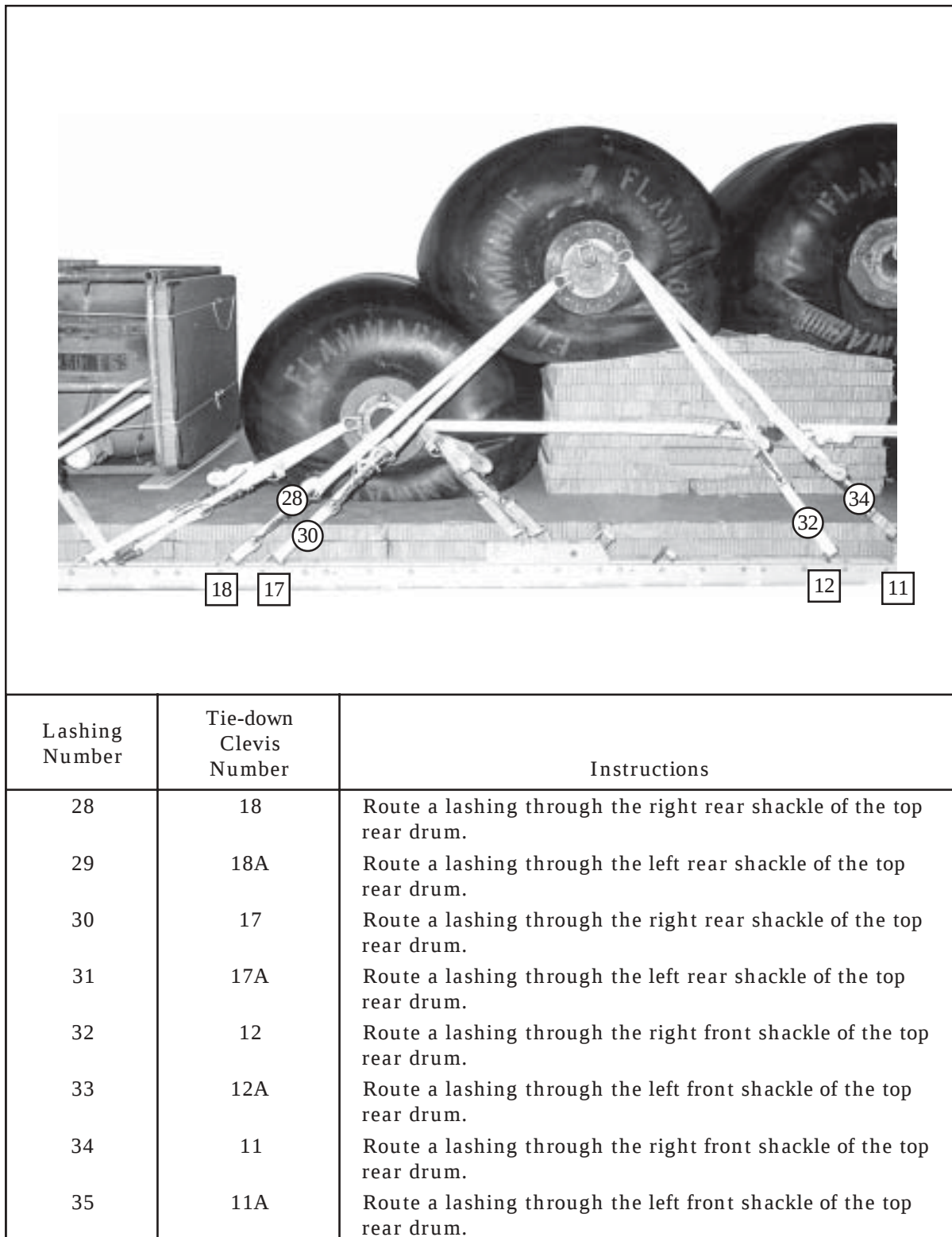


Figure 3-34. Lashings 28 through 35 Installed

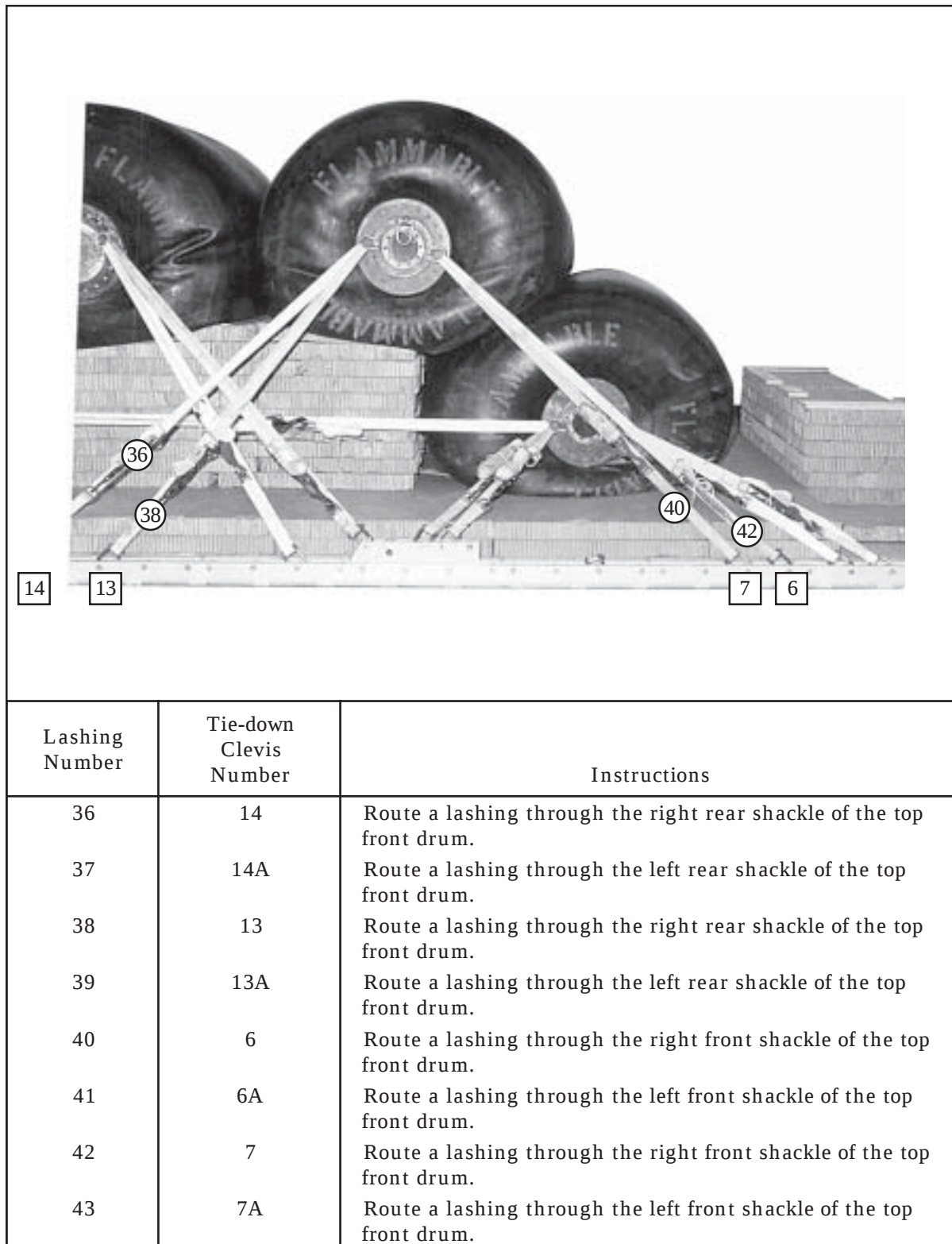


Figure 3-35. Lashings 36 through 43 Installed

PREPAING AND POSITIONING THE PUMP

3-35. Prepare the pump according to paragraph 2-5 and as shown in Figure 2-8.
Position the pump as shown in Figure 3-14.

LASHING THE PUMP TO THE PLATFORM

3-36. Lash the pump to the platform as shown in Figure 3-36.

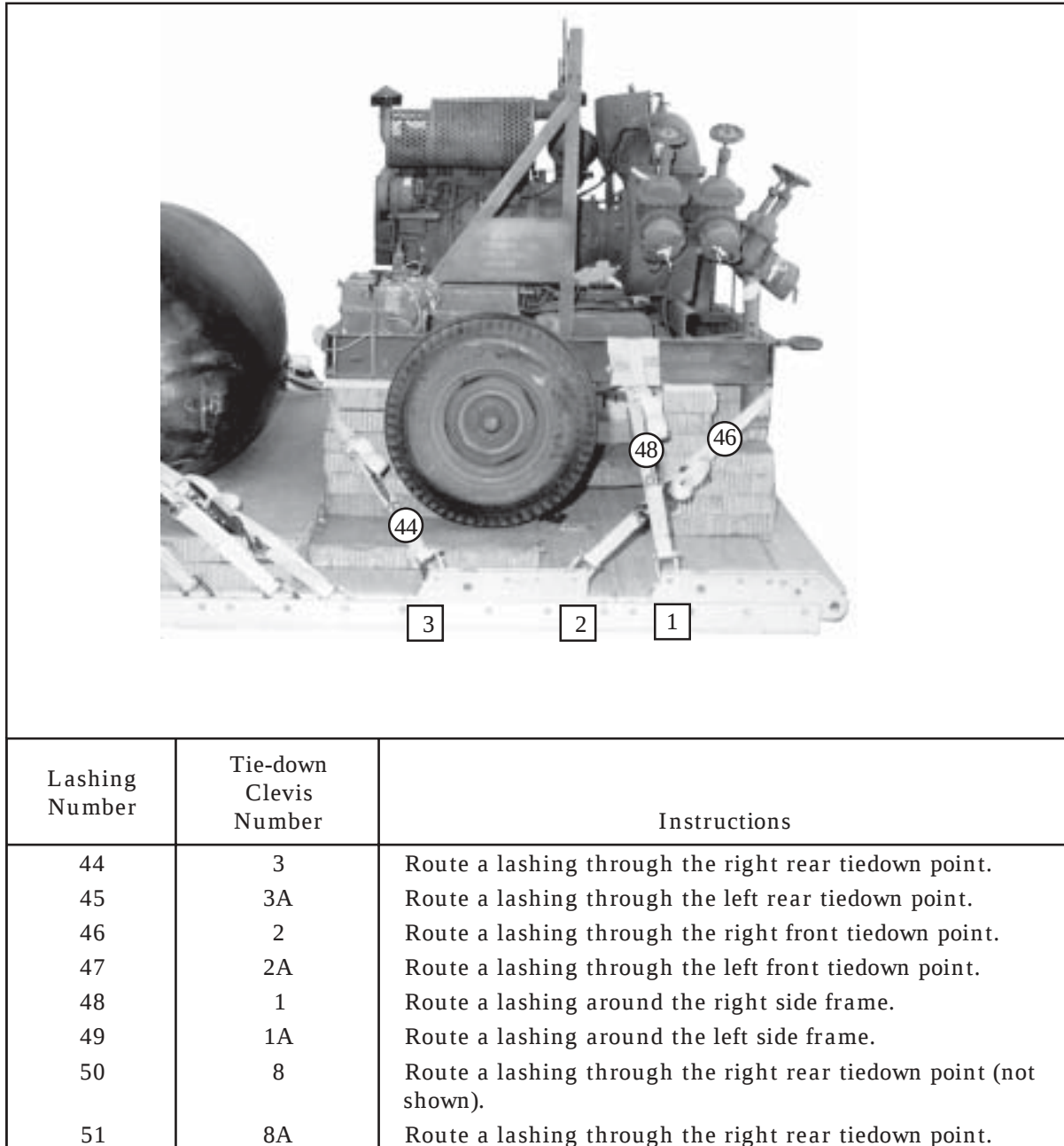


Figure 3-36. Lashings 44 through 51 Installed

COVERING THE PUMP

3-37. Place a canvas cover over the pump as shown in Figure 3-16. Position the pump as shown in Figure 3-14.

INSTALLING SUSPENSION SLINGS AND SAFETY TIES

3-38. Install suspension slings and safety ties as shown in Figure 3-37.

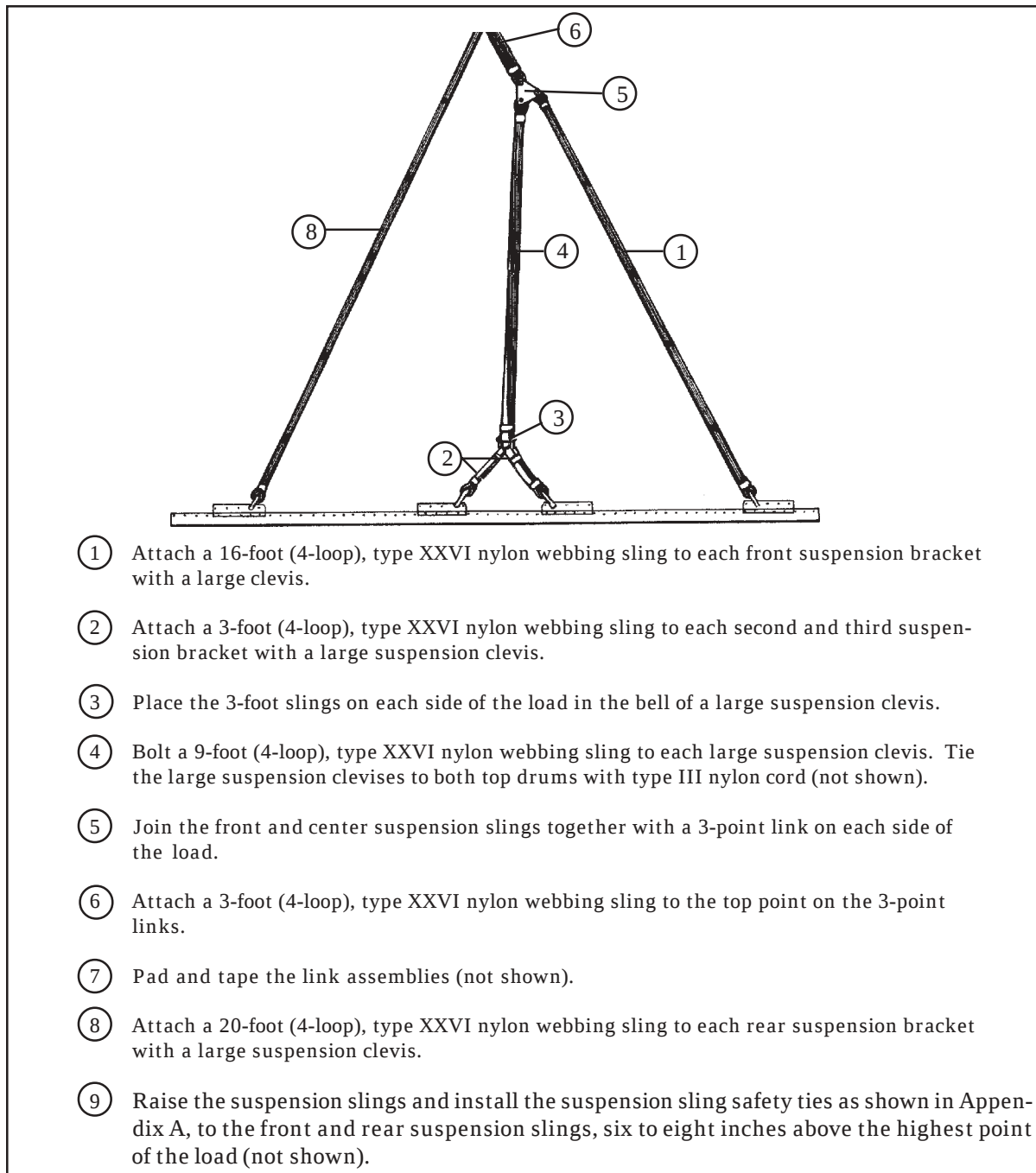
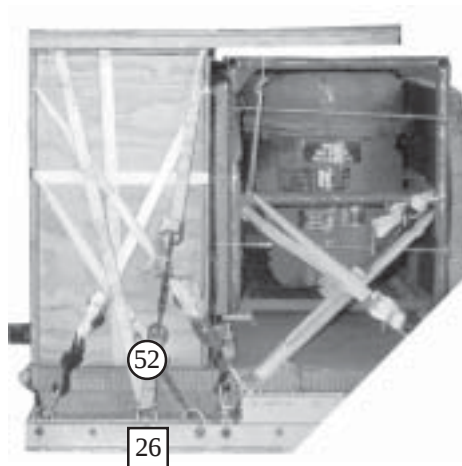
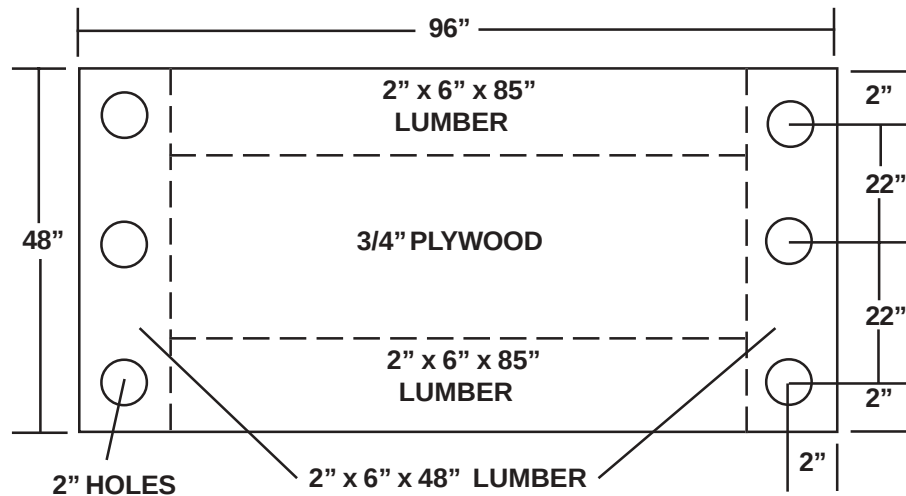


Figure 3-37. Suspension Slings and Safety Ties Installed

BUILDING AND POSITIONING PARACHUTE STOWAGE PLATFORM

3-39. Build and stow the parachute stowage platform as shown in Figure 3-38.

Align the rear edge of the stowage platform on the rear edge of the box.



Lashing Number	Tie-down Clevis Number	Instructions
52	26	Route a lashing from clevis 26 through the rear and center right holes of the stowage platform.
53	26A	Route a lashing from clevis 26A through the rear and center left holes in the stowage platform.

Figure 3-38. Parachute Stowage Platform Built and Positioned

PREPARING AND STOWING CARGO PARACHUTES

3-40. Prepare and stow cargo parachutes as shown in Figure 3-39.

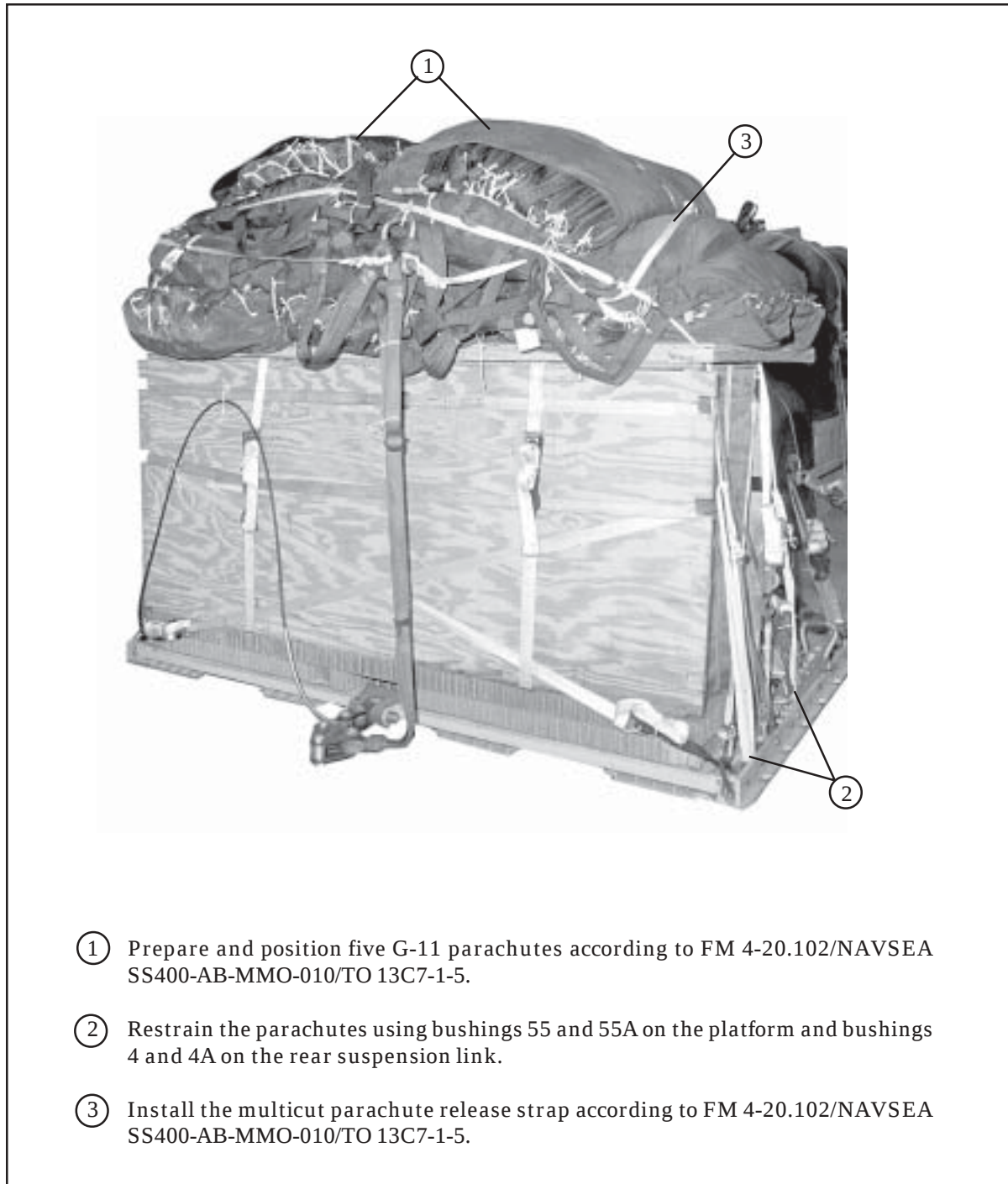


Figure 3-39. Parachute Stowage Platform Built and Positioned

INSTALLING THE EXTRACTION SYSTEM

3-41. Install the extraction system as shown in Figure 3-40.

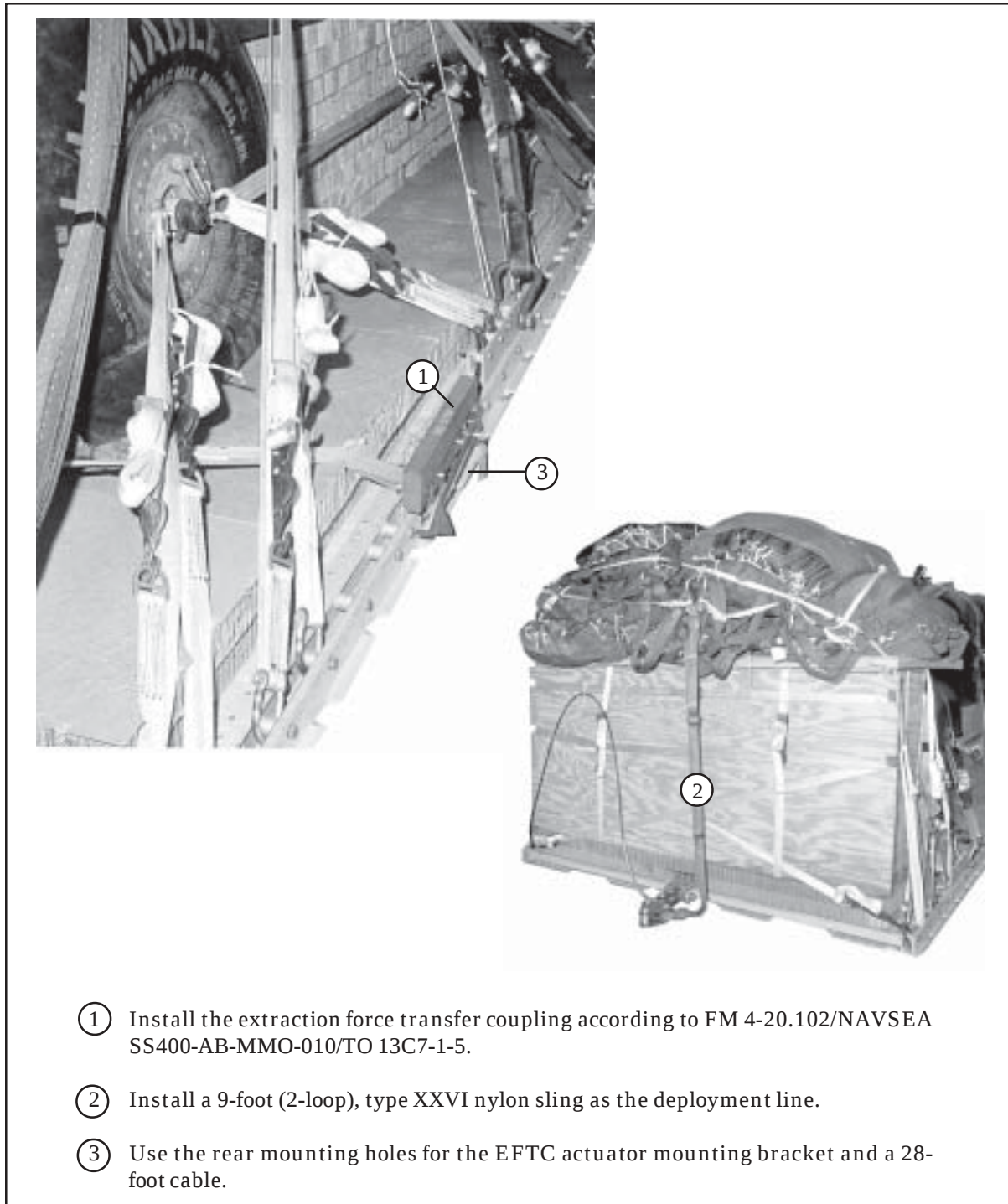


Figure 3-40. Extraction System Installed

INSTALLING THE PARACHUTE RELEASE SYSTEM

3-42. Install the parachute release system as shown in Figure 3-41.

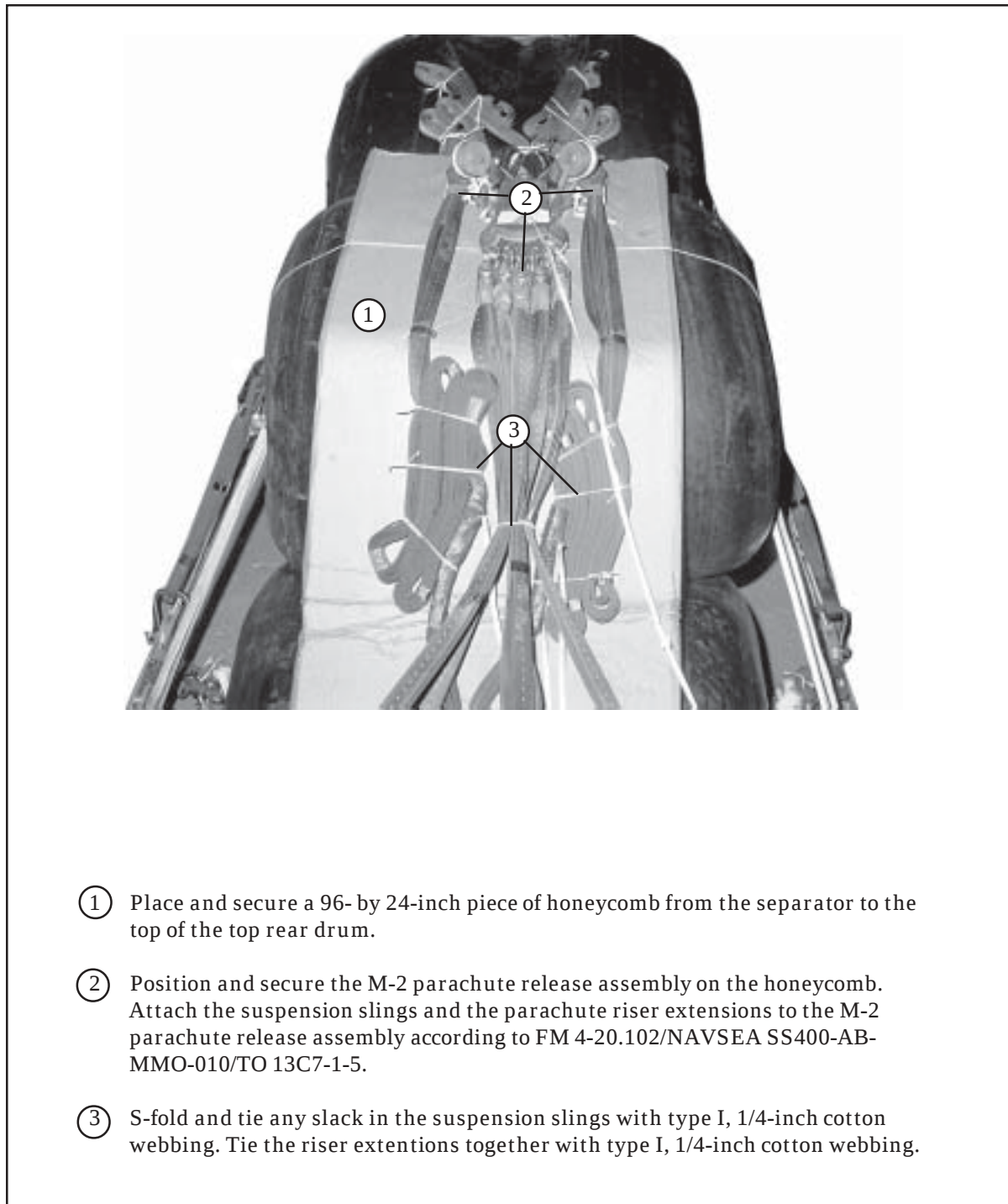


Figure 3-41. Parachute Release Assembly Installed

PLACING EXTRACTION PARACHUTE

3-43. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

3-44. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

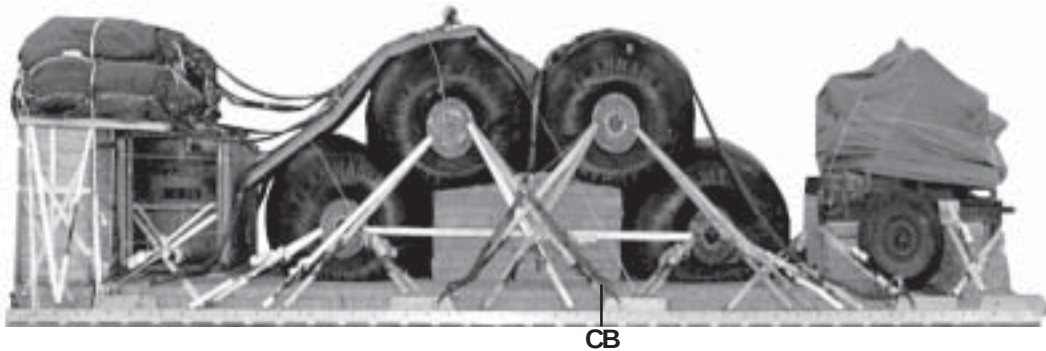
3-45. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 3-42. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

3-46. Use the equipment list in Table 3-2 to rig the load shown in Figure 3-42.

CAUTION:

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.



RIGGED LOAD DATA

Weight	24,408 pounds
Maximum Weight	25,700 pounds
Height	89 inches
Width	108 inches
Overall Length	363 inches
Overhang: Front (Tongue of Pump)	9 inches
Rear (EFTC)	18 inches
Center of Balance (CB) (from front edge of platform)	172 inches
Extraction System	EFTC

Figure 3-42. Four 500-Gallon Drums with Pump and Separator Rigged for Low-Velocity Airdrop

Table 3-2. Equipment Required for Rigging Four 500-Gallon Drums with Pump and Separator

Table 3-2. Equipment Required for Rigging Four 500-Gallon Drums with Pump and Separator (continued)

National Stock Number	Item	Quantity
1670-00-753-3928	Pad, energy-dissipating (honeycomb), 3- by 36- by 96-in	30 sheets
1670-01-016-7841	Parachute: Cargo: G-11C	5
1670-00-040-8135	Cargo extraction: 28-ft	1
1670-01-063-3715	Drogue (for DES) 15-ft	1
1670-01-353-8425	Platform, airdrop, type V, 28-ft: Bracket assembly, coupling	(1)
1670-01-162-2372	Clevis assembly, type V	(68)
1670-01-162-2376	Extraction bracket assembly	(1)
1670-01-247-2389	Bracket, suspension	(8)
1670-01-162-2381	Tandem link assembly (Multipurpose link)	(2)
5530-00-128-4981	Plywood, 3/4-in	4 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
	Sling, cargo, airdrop	
	For suspension and lifting:	
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	6
1670-01-062-6305	9-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6308	16-ft (4-loop), type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), type XXVI nylon webbing	2
	For deployment:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6311	120-ft (2-loop), type XXVI nylon webbing	5
5340-00-040-8219	Strap, parachute release, multi-cut, comes w/ 2 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	68
8310-00-917-3945	Thread, Cotton, Ticket 8/7	As required
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Nylon, Type VIII	As required

SECTION III- RIGGING FIVE 500-GALLON DRUMS

DESCRIPTION OF LOAD

3-47. The five collapsible fuel drums are rigged on a 32-foot, type V platform with six G-11 cargo parachutes. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The five drums also have a 350-GPM pump with a separator and hose box as an accompanying load. The total rigged load has a maximum weight of 30,355 pounds with a width of 108 inches and length of 411 inches. It has an overhang of 18 inches in the front and 18 inches in the rear.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

3-48. Prepare a 32-foot type V airdrop platform using two tandem links, eight suspension brackets and 72 tie-down clevises as shown in Figure 3-43.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

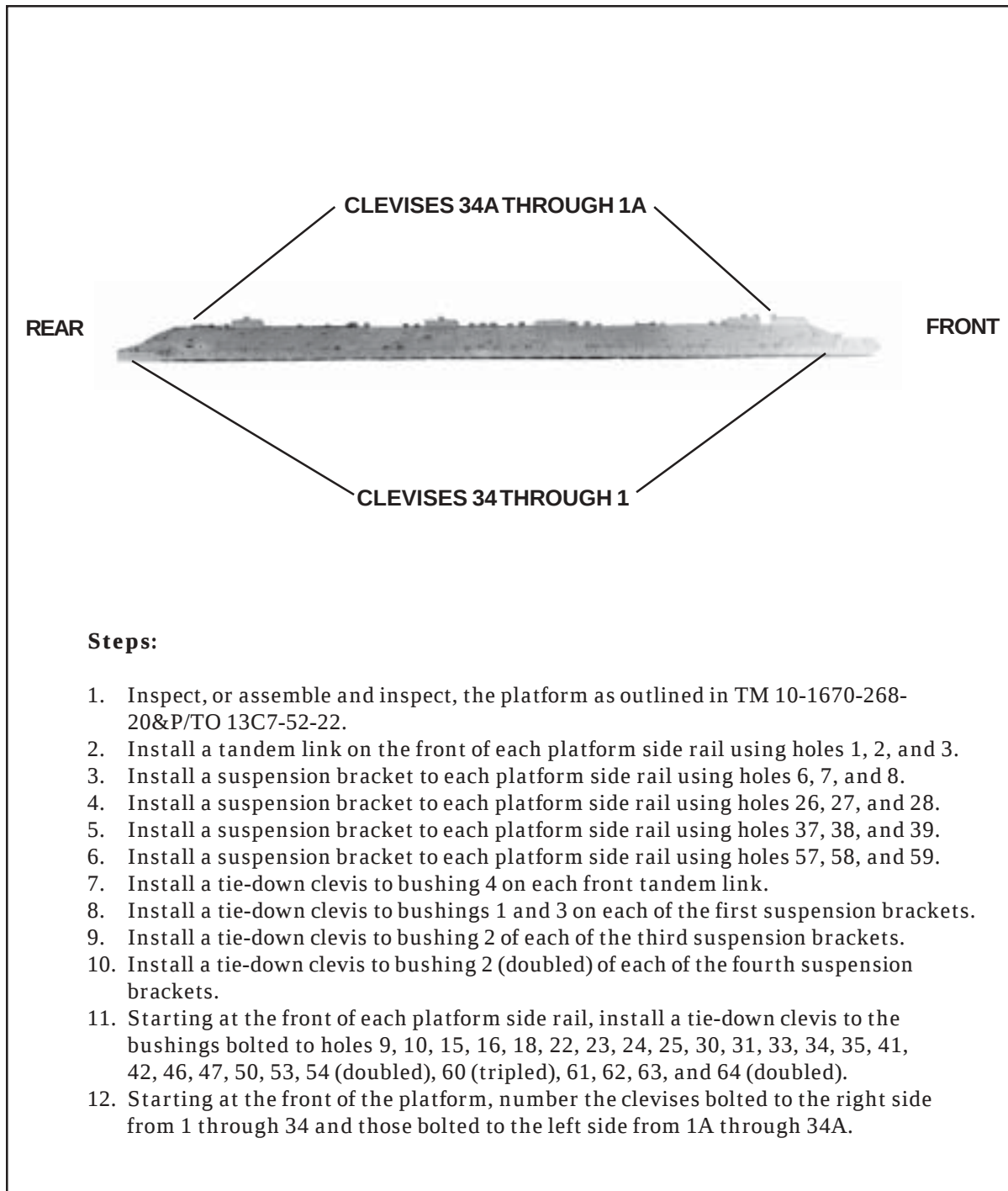


Figure 3-43. Platform Prepared

PREPARING HONEYCOMB

3-49. Build honeycomb stacks as shown in Figure 3-44.

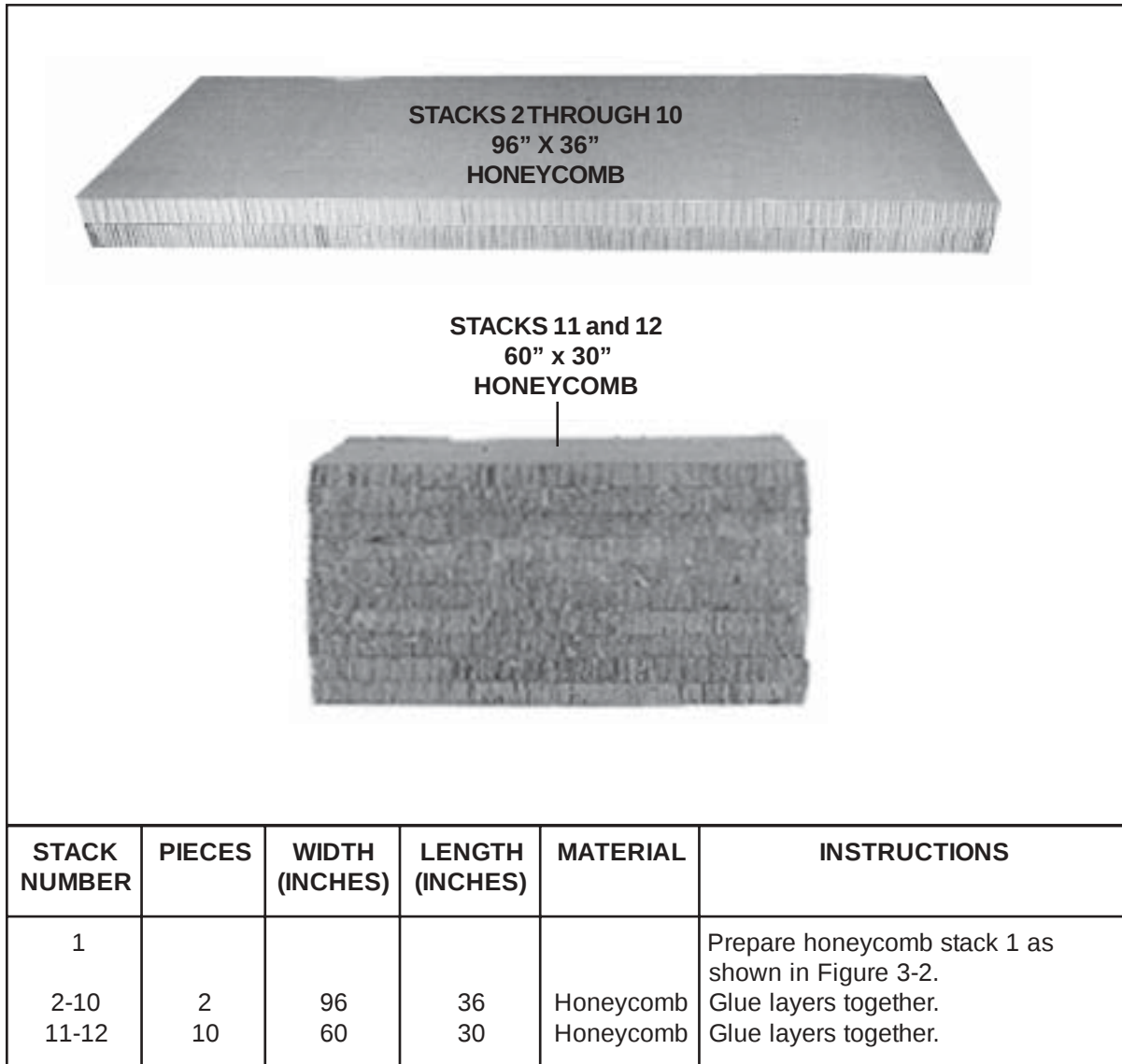


Figure 3-44. Honeycomb Stacks Prepared

POSITIONING HONEYCOMB STACKS

3-50. Position honeycomb stacks as shown in Figure 3-45.

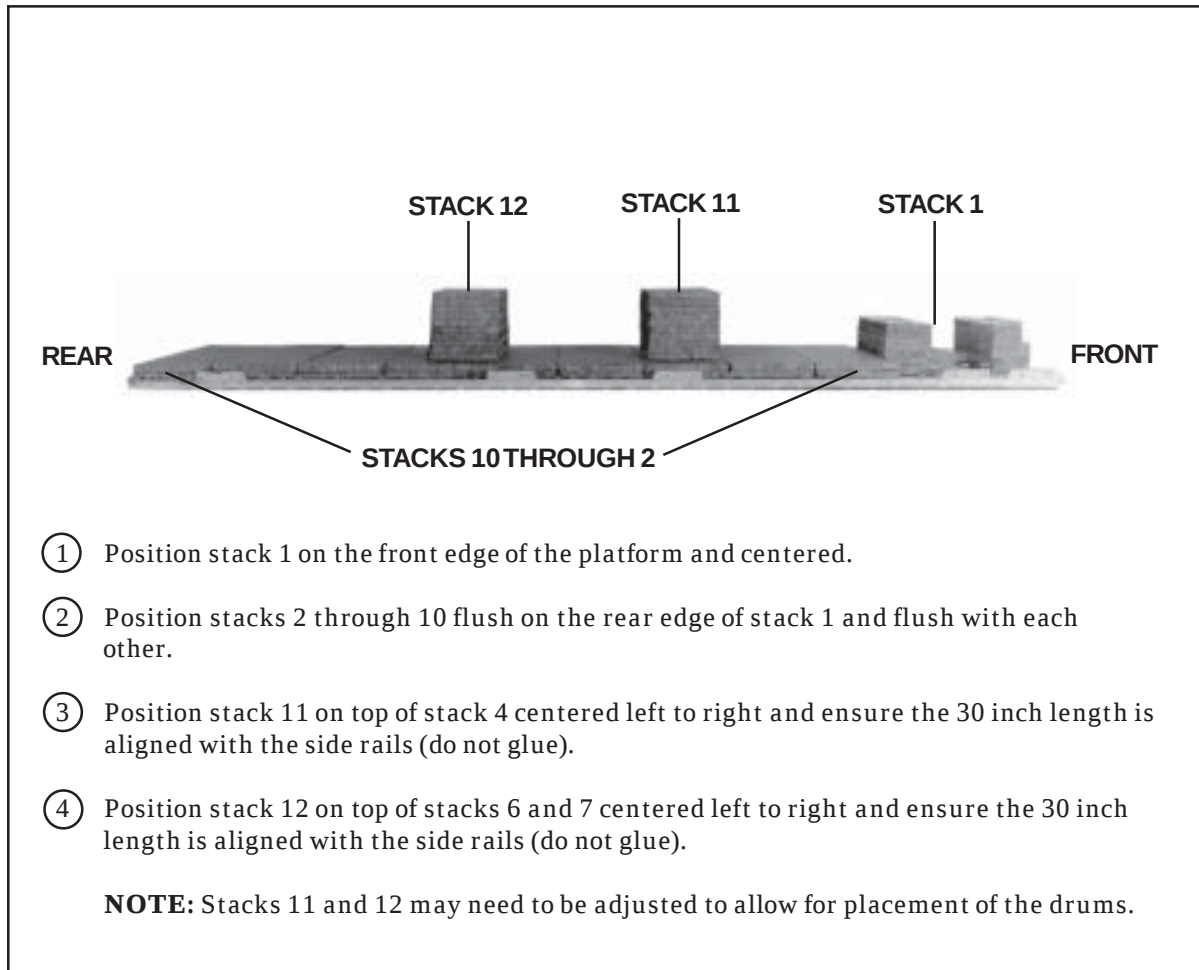


Figure 3-45. Honeycomb Stacks Positioned

BUILDING EQUIPMENT HOSE BOX

3-51. Build the equipment box as shown in Figure 3-5.

POSITIONING EQUIPMENT HOSE BOX

3-52. Position the equipment hose box as shown in Figure 3-6.

STORING EQUIPMENT IN THE EQUIPMENT HOSE BOX

3-53. Store the equipment in the equipment hose box as shown in Figure 3-7.

LASHING EQUIPMENT HOSE BOX TO PLATFORM

3-54. Lash the equipment hose box to the platform as shown in Figures 3-46 and 3-47.

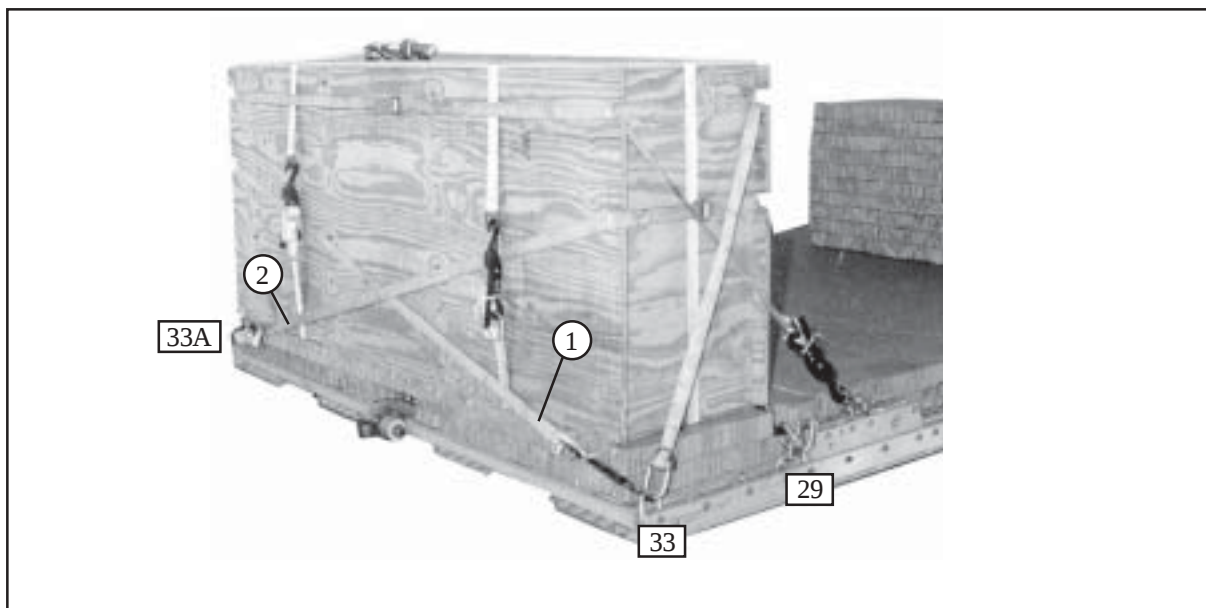


Figure 3-46. Lashings 1 and 2 Installed

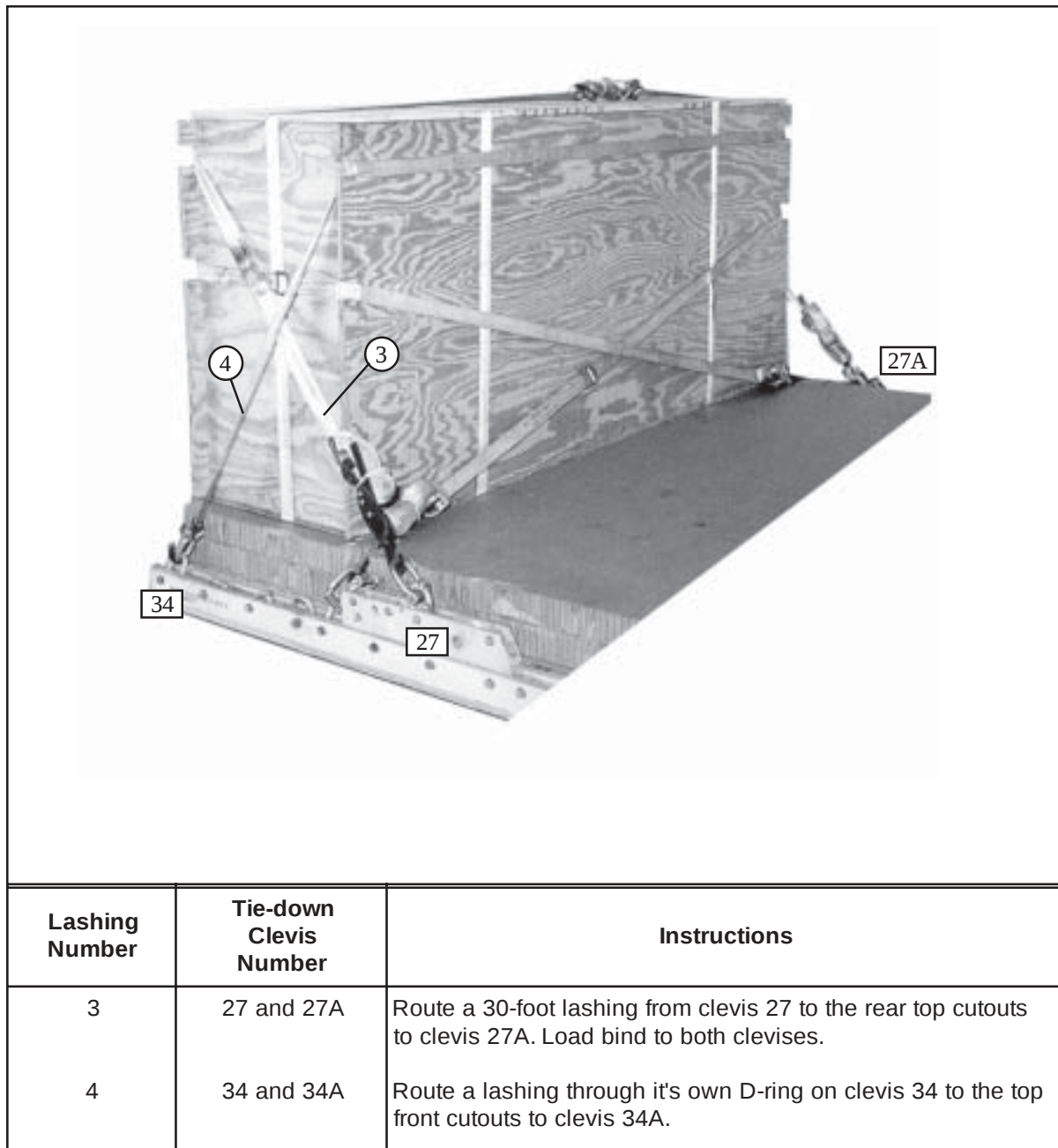


Figure 3-47. Lashings 3 and 4 Installed

PREPARING AND POSITIONING FUEL SEPARATOR

3-55. Prepare and position the fuel separator as shown in Figure 3-10.

LASHING FUEL SEPARATOR TO PLATFORM

3-56. Lash fuel separator to the platform as shown in Figure 3-48.

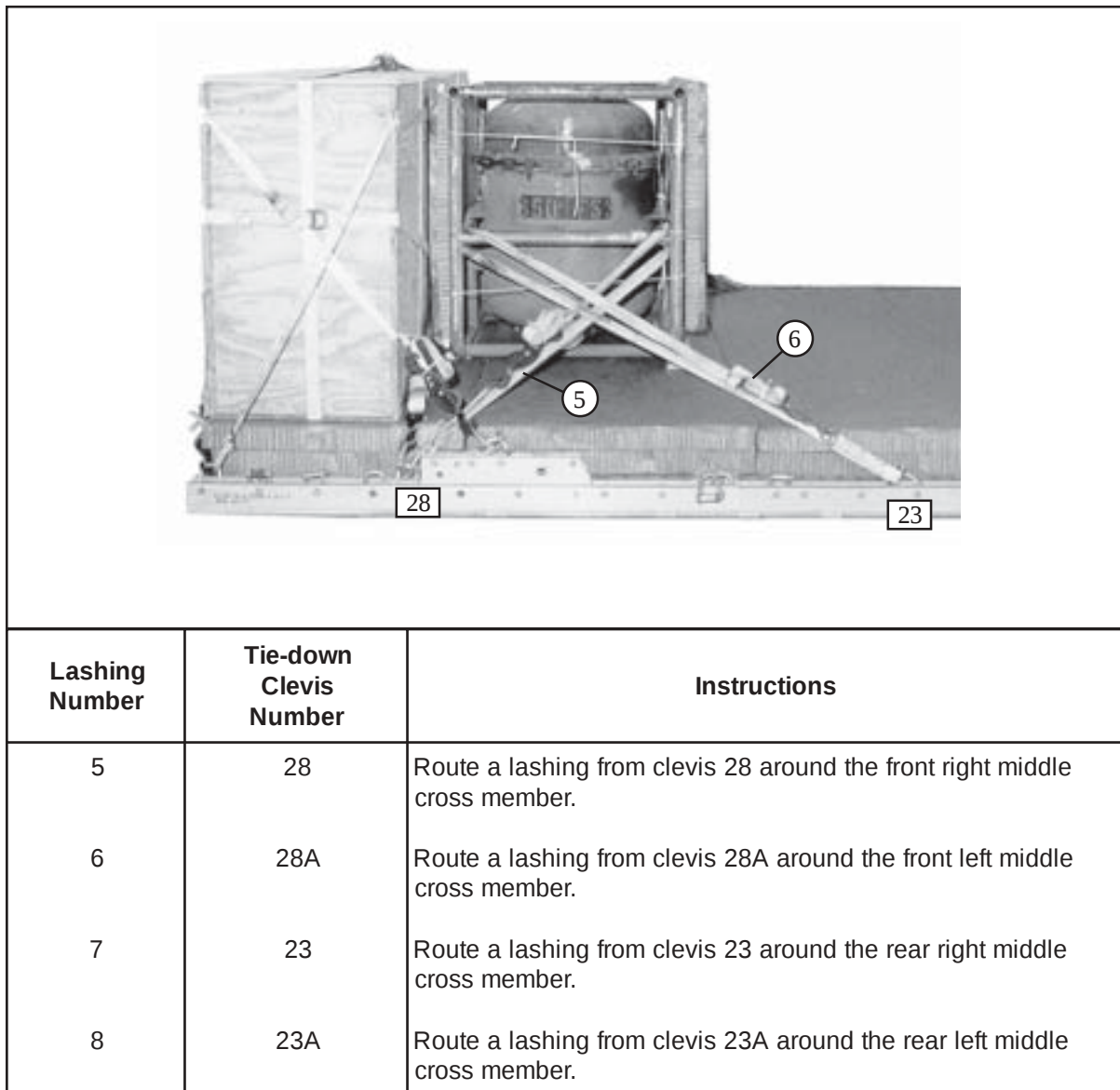


Figure 3-48. Lashings 5 through 8 Installed

POSITIONING AND LASHING THE DRUMS

3-57. Position and lash the drums to the platform as shown in Figures 3-49 through 3-55.

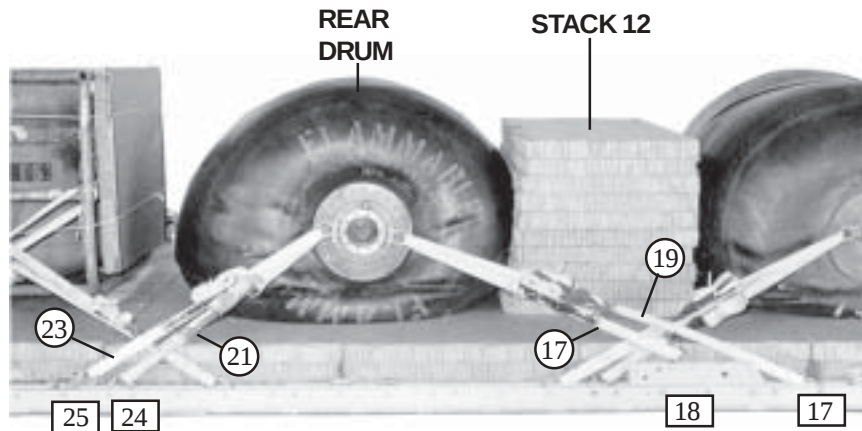
The diagram illustrates a top-down view of a drum being positioned between two rectangular stacks, labeled 'STACK 11' on the right and 'STACK 12' on the left. The drum is labeled 'MIDDLE DRUM'. Six lashing points are indicated with circled numbers: 9 (top right), 10 (bottom right), 11 (bottom right, near stack 11), 13 (bottom left), 15 (top left), and 19 (bottom left). Below the drum, six rectangular boxes represent clevises: 10, 11, 9, 13, 19, and 20, arranged from right to left. Lines connect the numbered lashing points to their corresponding clevises.

Steps:

1. Place a platform clevis on one end of two 9-foot (2-loop), type XXVI nylon webbing slings. Attach the slings to each side of the drum (for lifting purpose only) and remove after the drum is positioned (not shown).
2. Position the middle drum centered between stacks 11 and 12, and left to right on the platform. Stacks 11 and 12 may need to be moved during placement.

Lashing Number	Tie-down Clevis Number	Instructions
9	10	Route a lashing from clevis 10 to the right front shackle of the drum.
10	10A	Route a lashing from clevis 10A to the left front shackle of the drum.
11	9	Route a lashing from clevis 9 to the right front shackle of the drum.
12	9A	Route a lashing from clevis 9A to the left front shackle of the drum.
13	19	Route a lashing from clevis 19 to the right rear shackle of the drum.
14	19A	Route a lashing from clevis 19A to the left rear shackle of the drum.
15	20	Route a lashing from clevis 20 to the right rear shackle of the drum.
16	20A	Route a lashing from clevis 19A to the left rear shackle of the drum.

Figure 3-49. Lashings 9 Through 16 Installed

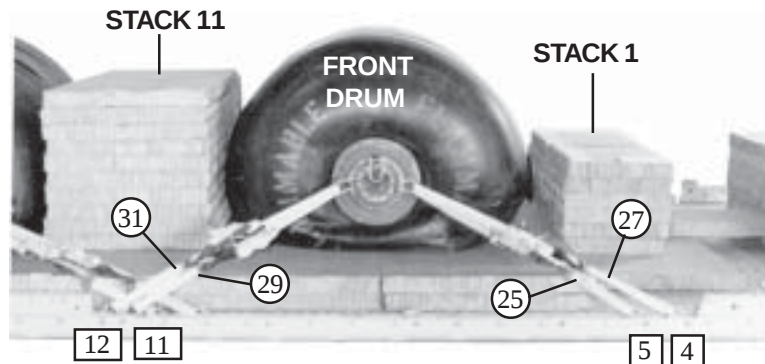


Steps:

1. Place a platform clevis on one end of two 9-foot (2-loop), type XXVI nylon webbing slings. Attach the slings to each side of the drum, for lifting purpose only, and remove after the drum is positioned (not shown).
2. Position the rear drum to the rear of stack 12 centered, and left to right on the platform.

Lashing Number	Tie-down Clevis Number	Instructions
17	18	Route a lashing from clevis 18 to the right front shackle of the drum.
18	18A	Route a lashing from clevis 18A to the left front shackle of the drum.
19	17	Route a lashing from clevis 17 to the right front shackle of the drum.
20	17A	Route a lashing from clevis 17A to the left front shackle of the drum.
21	24	Route a lashing from clevis 24 to the right rear shackle of the drum.
22	24A	Route a lashing from clevis 24A to the left rear shackle of the drum.
23	25	Route a lashing from clevis 25 to the right rear shackle of the drum.
24	25A	Route a lashing from clevis 25A to the left rear shackle of the drum.

Figure 3-49. Lashings 17 Through 24 Installed



Steps:

1. Place a platform clevis on one end of two 9-foot (2-loop), type XXVI nylon webbing slings. Attach the slings to each side of the drum (for lifting purpose only) and remove after the drum is positioned (not shown).
2. Position the front drum between stacks 1 and 11 and centered from left to right on the platform. Stacks 11 and 12 may need to be moved during placement.

Lashing Number	Tie-down Clevis Number	Instructions
25	5	Route a lashing from clevis 5 to the right front shackle of the drum.
26	5A	Route a lashing from clevis 5A to the left front shackle of the drum.
27	4	Route a lashing from clevis 4 to the right front shackle of the drum.
28	4A	Route a lashing from clevis 4A to the left front shackle of the drum.
29	11	Route a lashing from clevis 11 to the right rear shackle of the drum.
30	11A	Route a lashing from clevis 11A to the left rear shackle of the drum.
31	12	Route a lashing from clevis 12 to the right rear shackle of the drum.
32	12A	Route a lashing from clevis 12A to the left rear shackle of the drum.

Figure 3-51. Lashings 25 Through 32 Installed

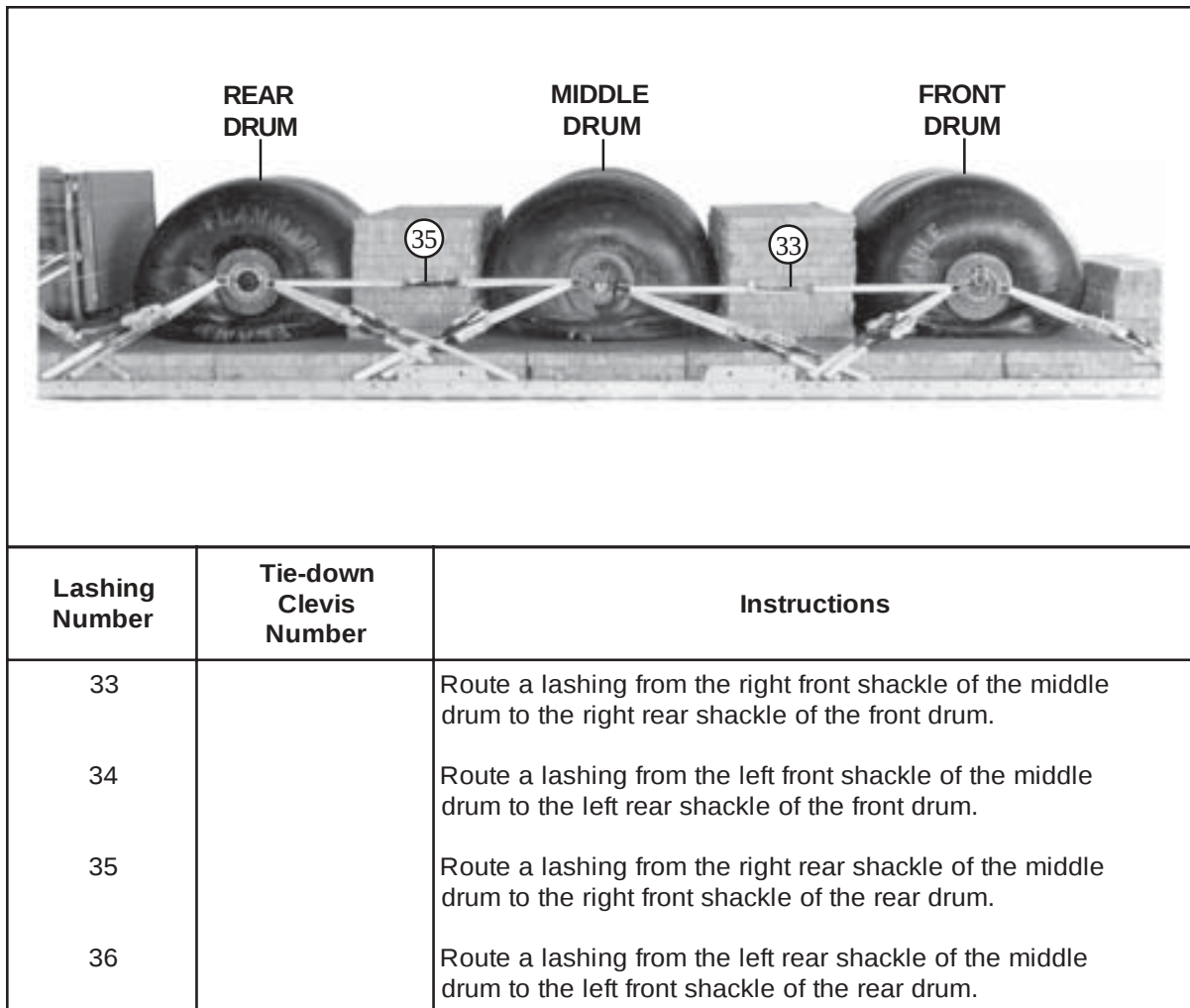
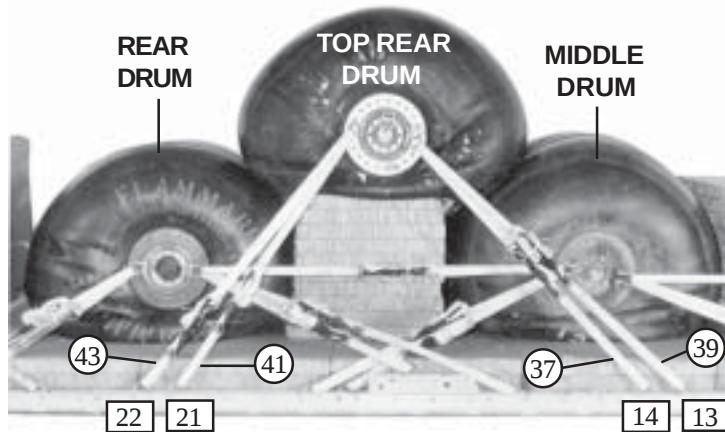


Figure 3-52. Lashings 33 Through 36 Installed

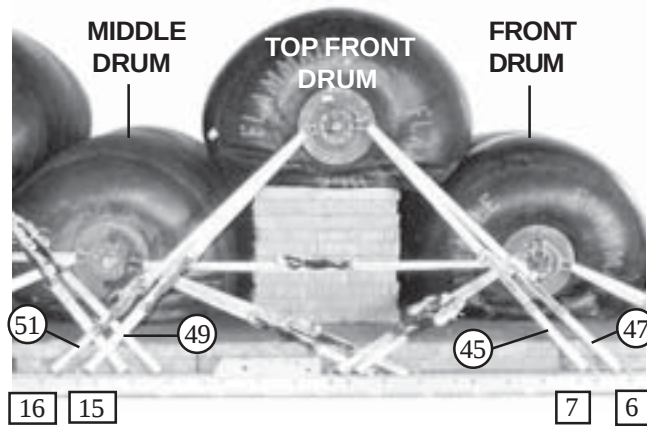


Steps:

1. Place a platform clevis on one end of two 9-foot (2-loop), type XXVI nylon webbing slings. Attach the slings to each side of the drum (for lifting purpose only) and remove after the drum is positioned (not shown).
2. Position the top rear drum on stack 12 and centered from left to right on the platform.

Lashing Number	Tie-down Clevis Number	Instructions
37	14	Route a lashing from clevis 14 to the right front shackle of the drum.
38	14A	Route a lashing from clevis 14A to the left front shackle of the drum.
39	13	Route a lashing from clevis 13 to the right front shackle of the drum.
40	13A	Route a lashing from clevis 13A to the left front shackle of the drum.
41	21	Route a lashing from clevis 21 to the right rear shackle of the drum.
42	21A	Route a lashing from clevis 21A to the left rear shackle of the drum.
43	22	Route a lashing from clevis 22 to the right rear shackle of the drum.
44	22A	Route a lashing from clevis 22A to the left rear shackle of the drum.

Figure 3-53. Lashings 37 Through 44 Installed

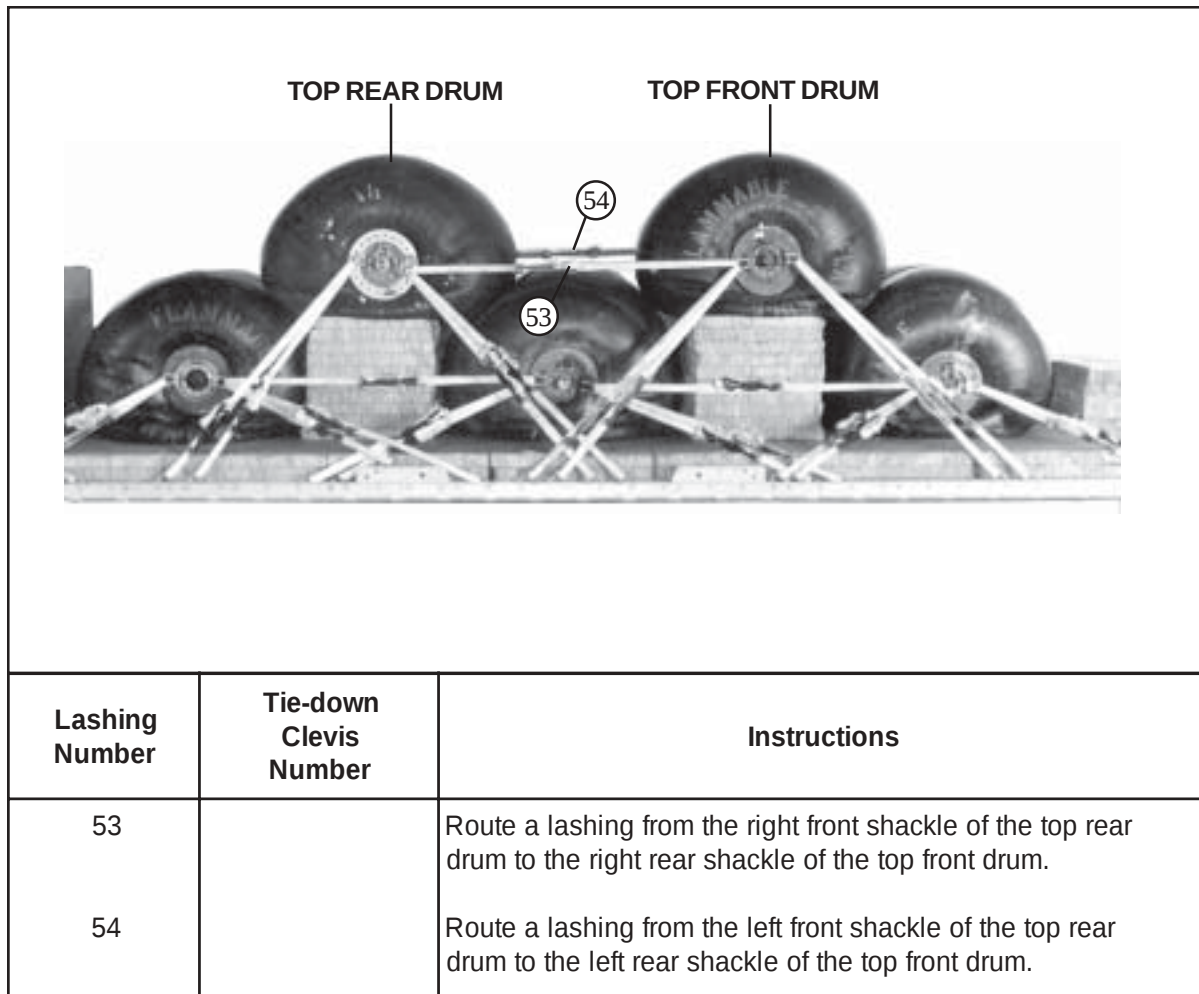


Steps:

1. Place a platform clevis on one end of two 9-foot (2-loop), type XXVI nylon webbing slings. Attach the slings to each side of the drum (for lifting purpose only) and remove after the drum is positioned (not shown).
2. Position the top front drum on stack 11 and centered from left to right on the platform.

Lashing Number	Tie-down Clevis Number	Instructions
45	7	Route a lashing from clevis 7 to the right front shackle of the drum.
46	7A	Route a lashing from clevis 7A to the left front shackle of the drum.
47	6	Route a lashing from clevis 6 to the right front shackle of the drum.
48	6A	Route a lashing from clevis 6A to the left front shackle of the drum.
49	15	Route a lashing from clevis 15 to the right rear shackle of the drum.
50	15A	Route a lashing from clevis 15A to the left rear shackle of the drum.
51	16	Route a lashing from clevis 16 to the right rear shackle of the drum.
52	16A	Route a lashing from clevis 16A to the left rear shackle of the drum.

Figure 3-54. Lashings 45 Through 52 Installed

**Figure 3-55. Lashings 53 and 54 Installed**

PREPARING AND POSITIONING PUMP

3-58. Prepare the pump according to paragraph 2-5 and as shown in Figure 2-8. Position the pump as shown in Figure 3-14.

LASHING THE PUMP TO THE PLATFORM

3-59. Lash the pump to the platform as shown in Figure 3-56.

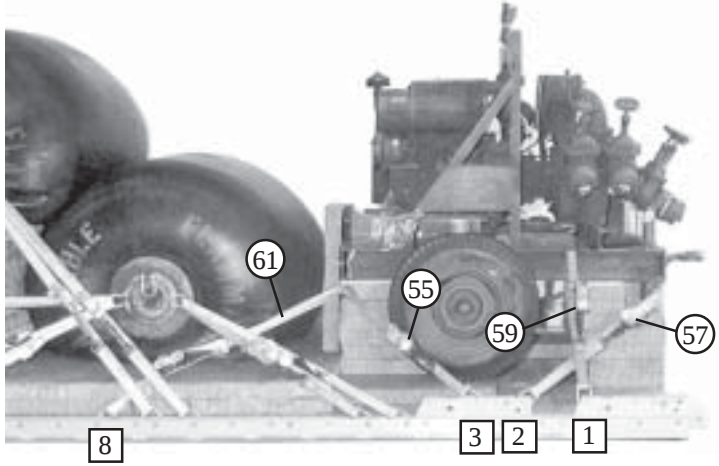
		
Lashing Number	Tie-down Clevis Number	Instructions
55	3	Route a lashing from clevis 3 to the right rear tiedown point.
56	3A	Route a lashing from clevis 3A to the left rear tiedown point.
57	2	Route a lashing from clevis 2 to the right front tiedown point.
58	2A	Route a lashing from clevis 2A to the left front tiedown point.
59	1	Route a lashing from clevis 1 to the right side frame.
60	1A	Route a lashing from clevis 1A to the left side frame.
61	8	Route a lashing from clevis 8 to the right rear tiedown point.
62	8A	Route a lashing from clevis 8A to the left rear tiedown point.

Figure 3-56. Lashings 55 Through 62 Installed

INSTALLING SUSPENSION SLINGS AND SAFETY TIES

3-60. Install suspension slings and safety ties as shown in Figure 3-57.

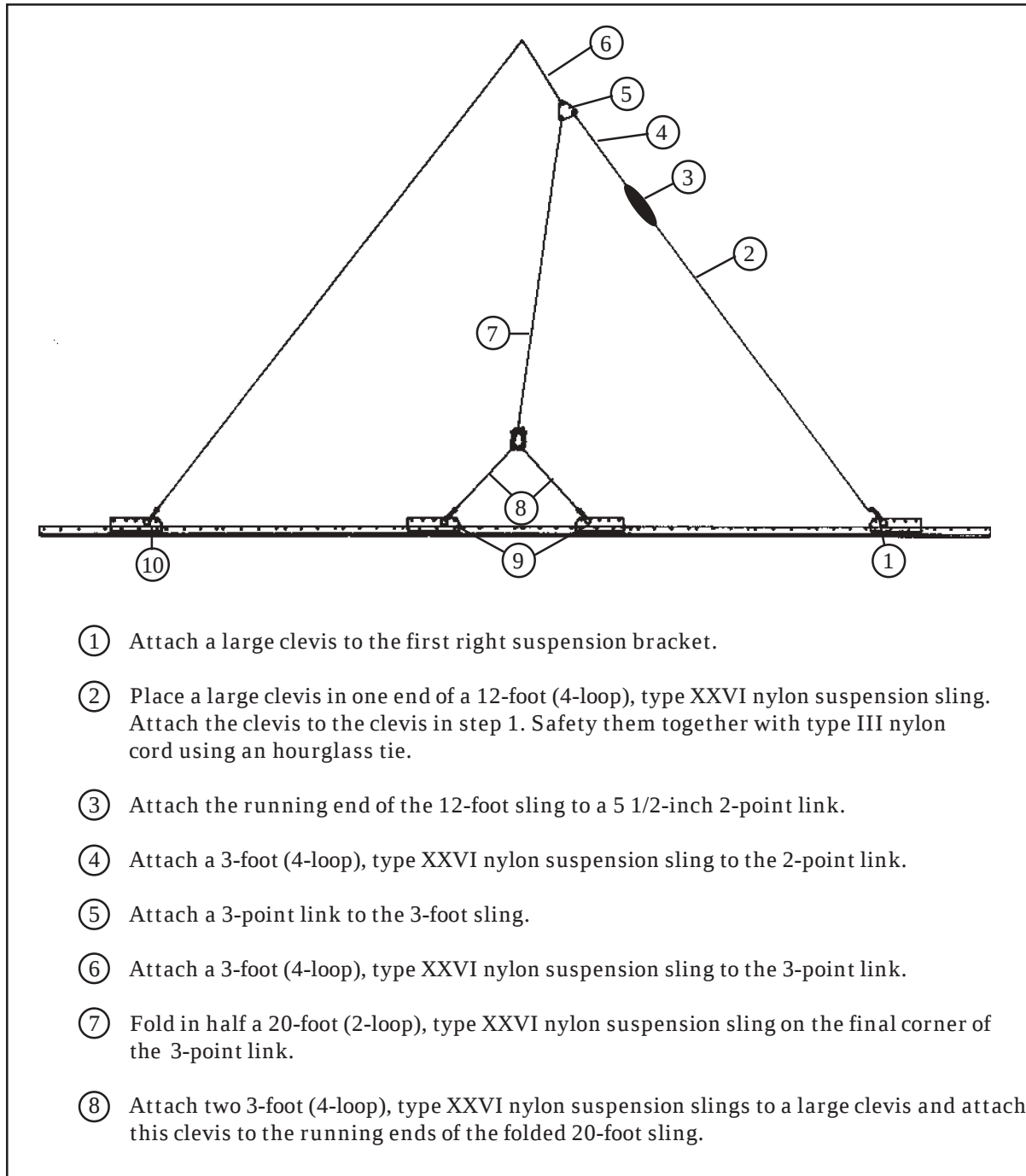


Figure 3-57. Suspension Slings and Safety Ties Installed

- ⑨ Attach one large clevis to each running end of the two 3-foot slings and attach one clevis to each second and third suspension brackets.
- ⑩ Place a large clevis in one end of a 20-foot (4-loop), type XXVI nylon suspension sling and attach the clevis to the right rear suspension bracket.
- ⑪ Repeat steps 1 through 10 for the left side of the platform.
- ⑫ Raise the suspension slings and install the suspension sling safety ties as shown in Appendix A, to the front and rear suspension slings, six to eight inches above the highest point of the load (not shown).
- ⑬ Pad and tape the link assemblies (not shown).

Figure 3-57. Suspension Slings and Safety Ties Installed (Continued)

COVERING THE PUMP

3-61. Place a canvas cover over the pump as shown in Figure 3-16.

BUILDING AND POSITIONING PARACHUTE STOWAGE PLATFORM

3-62. Build and position stowage platform as shown in Figure 3-58. Align the rear edge of the stowage platform on the rear edge of the box.

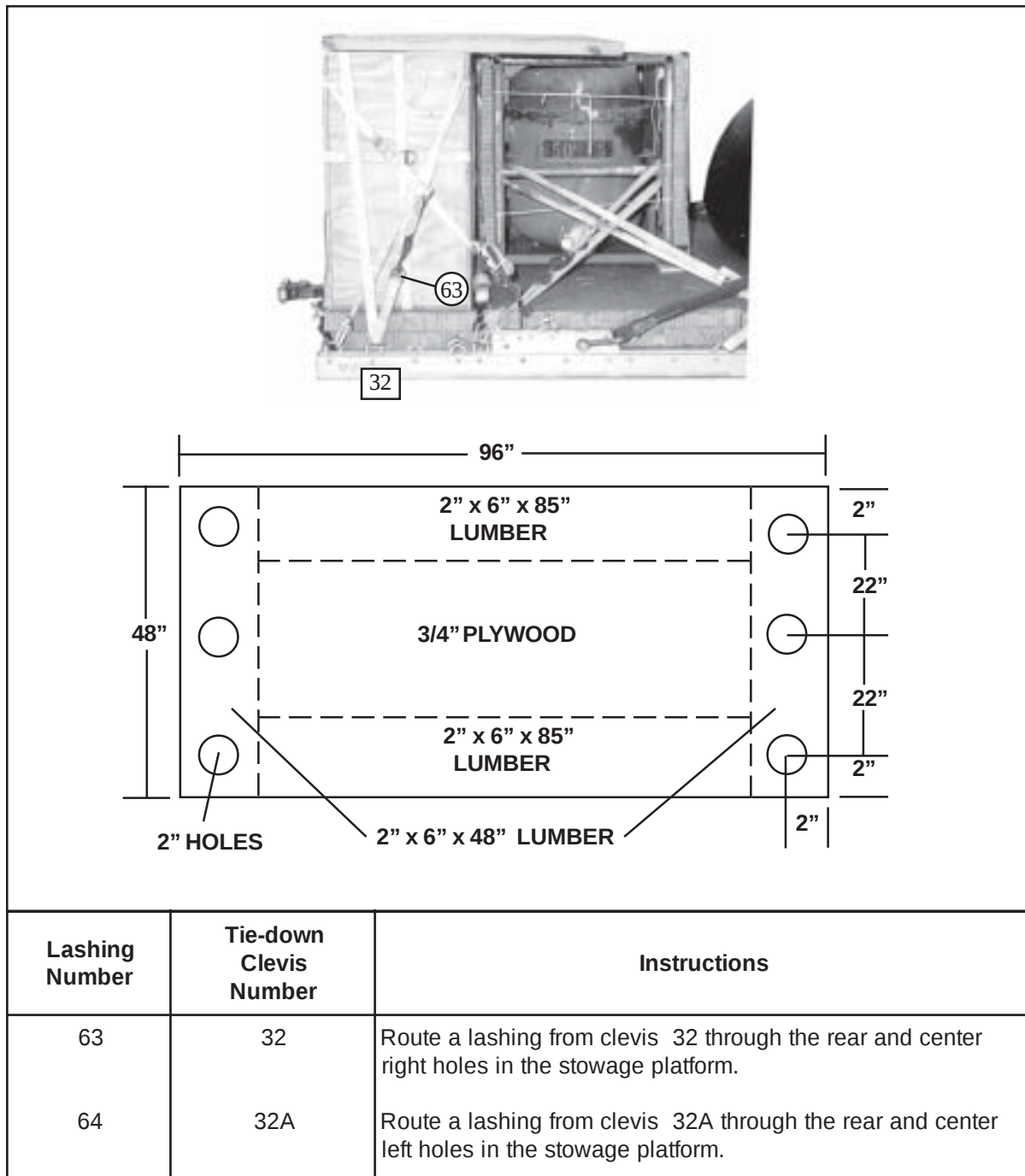


Figure 3-58. Parachute Stowage Platform Built and Positioned

PREPARING AND STOWING CARGO PARACHUTES

3-63. Prepare and stow cargo parachutes as shown in Figure 3-59.

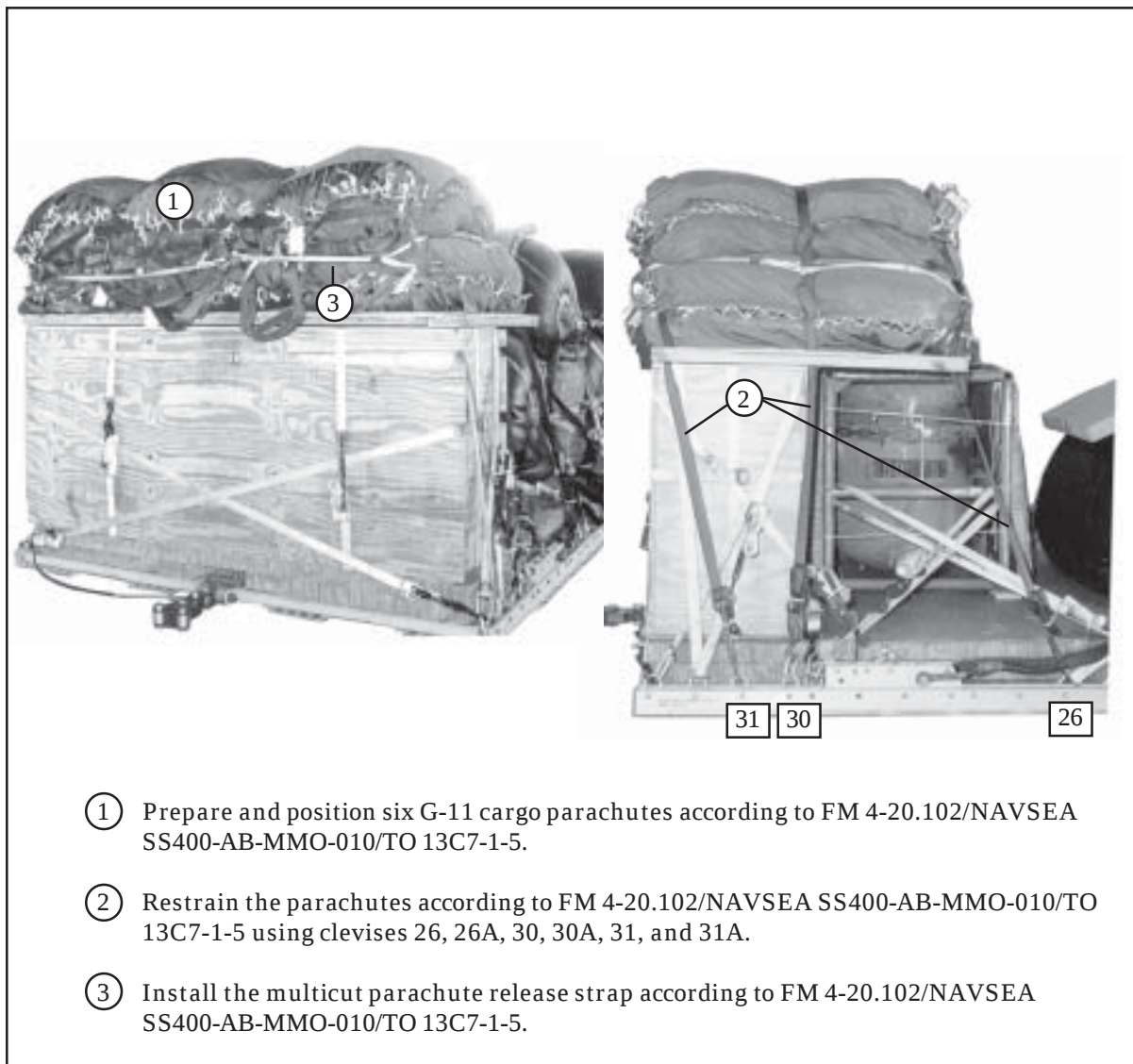


Figure 3-59. Cargo Parachutes Prepared and Stowed

INSTALLING THE EXTRACTION SYSTEM

3-64. Install the extraction system as shown in Figure 3-60.

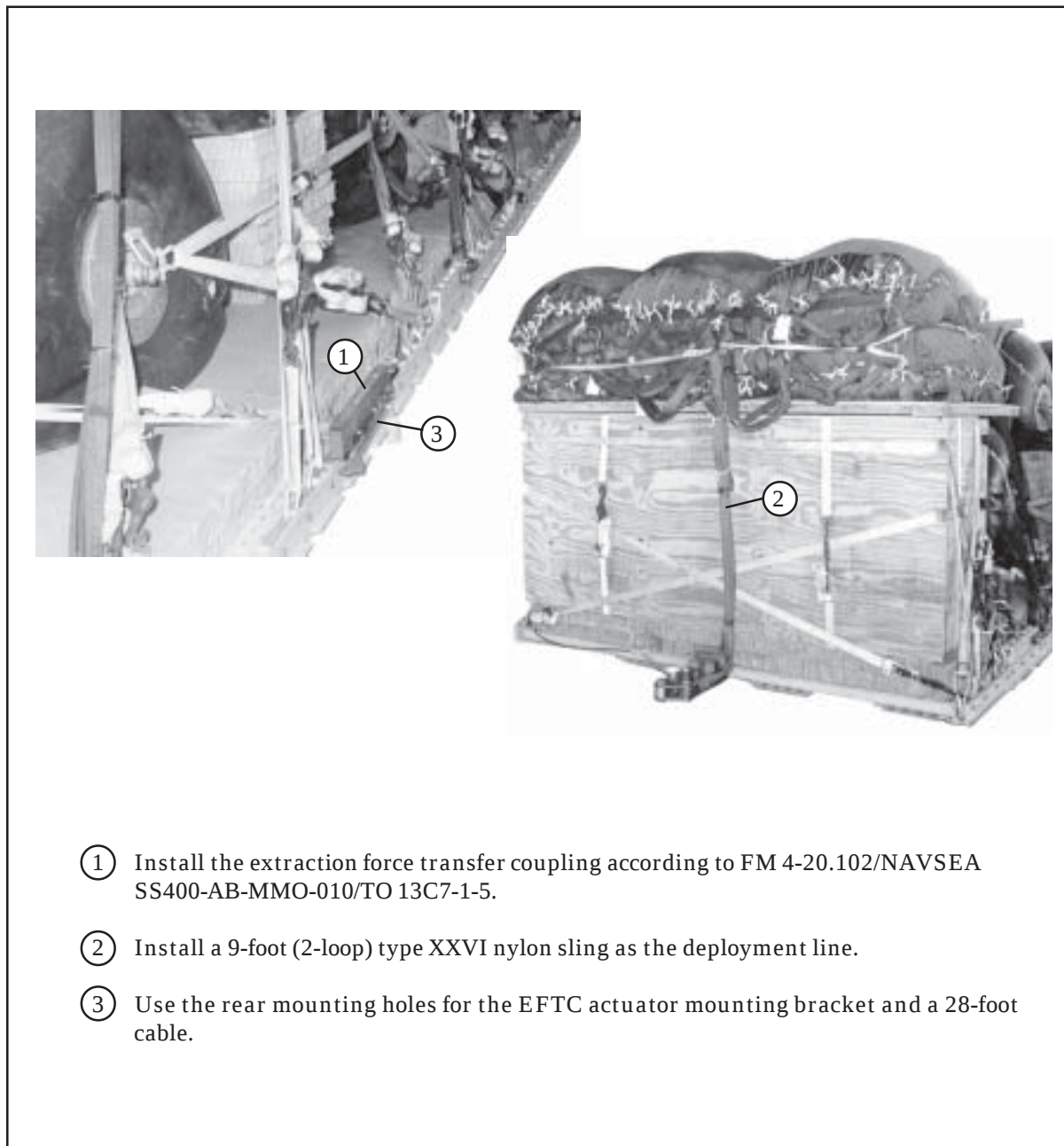


Figure 3-60. Extraction System Installed

INSTALLING THE PARACHUTE RELEASE SYSTEM

3-65. Install the release system as shown in Figure 3-61.

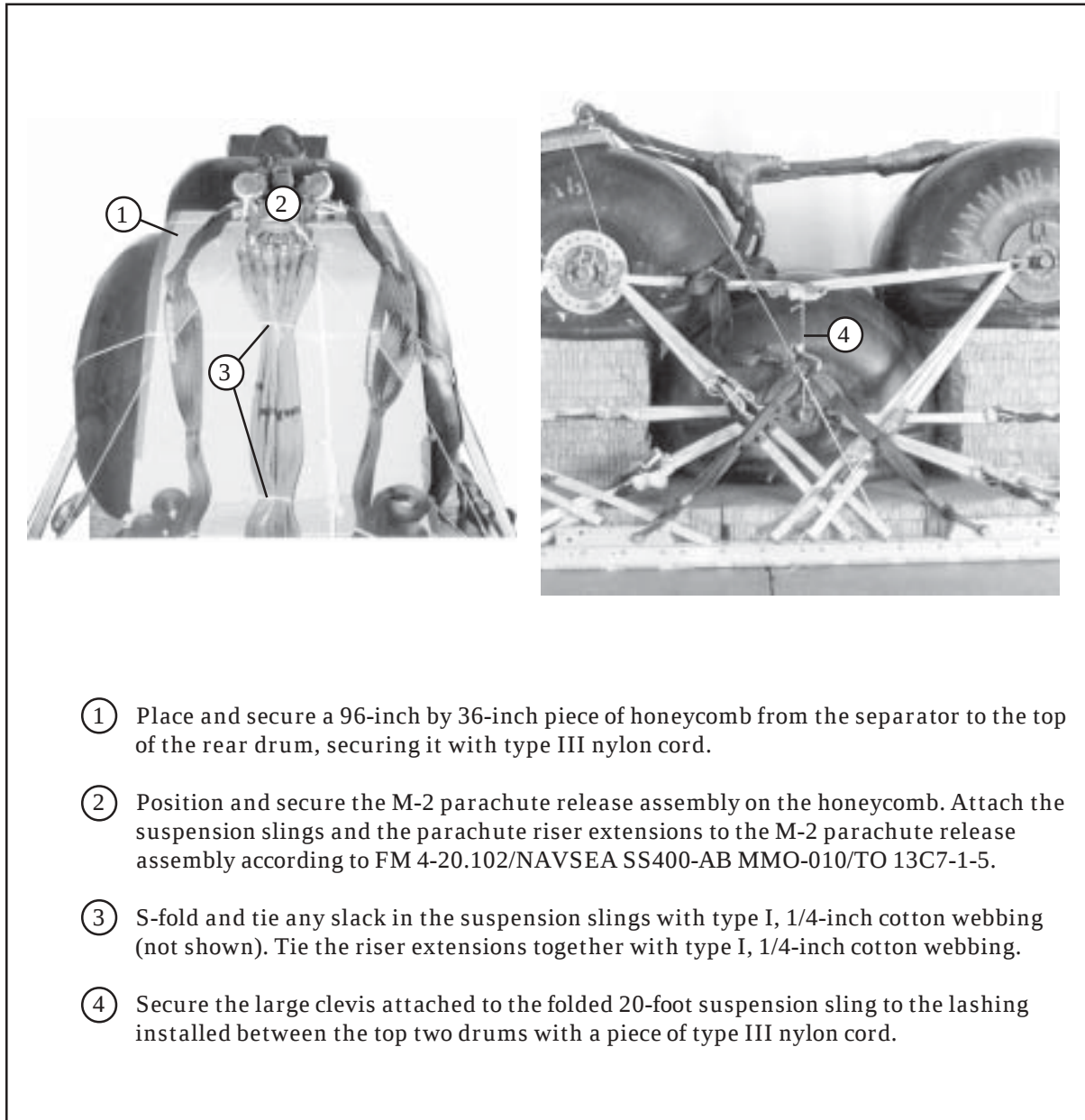


Figure 3-61. Release System Installed

PLACING EXTRACTION PARACHUTE

3-66. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

3-67. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

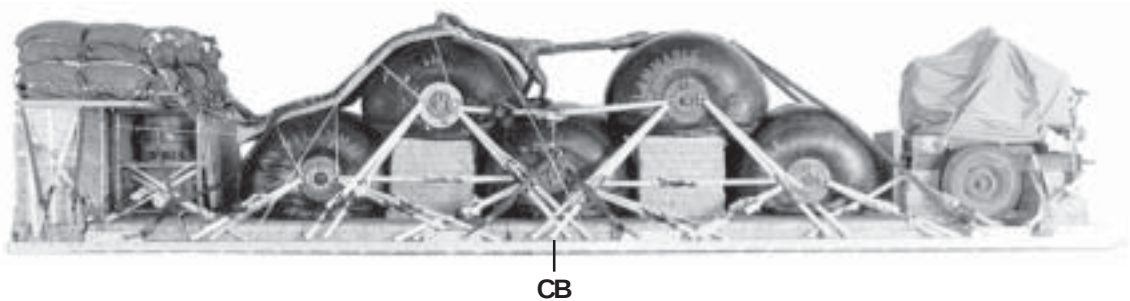
3-68. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 3-62. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

3-69. Use the equipment list in Table 3-3 to rig the load shown in Figure 3-62.

CAUTION

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.



RIGGED LOAD DATA

Weight	28,855 pounds
Maximum Weight	30,355 pounds
Height	75 inches
Width	108 inches
Overall Length	411 inches
Overhang: Front (Tongue of pump)	9 inches
Rear (EFTC)	18 inches
Center of Balance (CB) (from the front edge of the platform)	198 inches

Figure 3-62. Five 500-Gallon Drums With Pump and Separator Rigged for Low-Velocity Airdrop

Table 3-3. Equipment Required for Rigging Five 500-Gallon Drums with Pump and Separator

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	13
4030-00-678-8562	Clevis, medium	6
8305-00-880-8155	Cloth coated, green, 60-inch	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-01-326-7309	Coupling, airdrop, extraction force transfer w/28-ft	1
1670-00-360-0328	Cover, clevis, large	6
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-01-183-2678	Leaf, extraction line (line bag)(add 2 for DES)	2
1670-01-064-4452	Line, drogue (for C-17) 60-foot (1-loop), type XXVI	1
1670-01-062-6304	Line, deployment: 9-foot (2-loop), type XXVI	1
1670-01-062-6313	Line, extraction: For C-130: 60-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-141,C-5, C-17: 140-foot (3-loop), type XXVI	1
	Link assembly:	
	Two-point:	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	4
5310-00-232-5165	Nut, 1-in, hexagonal	4
1670-00-003-1954	Plate, side, 5 1/2-in	4
5365-00-007-3414	Spacer, large	4
	Two-point: (for DES)	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2

Table 3-3. Equipment Required for Rigging Five 500-Gallon Drums with Pump and Separator (Continued)

National Stock Number	Item	Quantity
1670-01-307-1055	Three-point	2
1670-00-006-2752	Four-point	1
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1
5510-00-220-6146	Lumber: 2- by 4-in	As required
5510-00-220-6148	2- by 6-in	As required
5315-00-010-4659	Nail, steel wire, common, 8d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	38 sheets
1670-01-016-7841	Parachute: Cargo, G-11C	6
1670-00-040-8135	Cargo, extraction, 28ft	2
1670-01-063-3715	Droque, 15ft (for DES)	1
1670-01-353-8425	Platform, airdrop, type V, 32-foot: Bracket assembly, component, (EFTC)	(1)
167001-247-2389	Bracket, suspension	(8)
1670-01-162-2372	Clevis assembly, type V	(72)
1670-01-353-8424	Extraction bracket assembly	(1)
1670-01-162-2381	Link, tandem, suspension link assembly	(2)
5530-00-618-8073	Plywood, 3/4- by 48- by 96-in	4 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
1670-01-062-6306	Sling, cargo airdrop For suspension: 3-ft (4-loop), type XXVI nylon webbing	8
1670-01-062-6307	12-ft (4-loop), type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6302	20-ft (2-loop), type XXVI nylon webbing	2
1670-01-062-6311	For riser extension: 120-ft (2-loop), type XXVI nylon webbing	6
1670-00-040-8219	Strap, parachute release, multicut	2

**Table 3-3. Equipment Required for Rigging Five 500-Gallon Drums with Pump and Separator
(Continued)**

National Stock Number	Item	Quantity
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	61
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-260-6890	Type X	As required

SECTION IV- RIGGING SIX 500-GALLON DRUMS

DESCRIPTION OF LOAD

3-70. The six collapsible fuel drums are rigged on a 32-foot, type V platform with seven G-11 cargo parachutes. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The six drums also have a 350-GPM pump with a separator and hose box as an accompanying load. The total rigged load has a maximum weight of 34,480 pounds with a width of 108 inches and length of 411 inches. It has an overhang of 9 inches in the front and 18 inches in the rear.

- Notes:**
1. For drums filled with liquid other than water, use Table 1-1 to recompute the weight.
 2. If the load varies from the shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

3-71. Prepare a 32-foot type V airdrop platform using two tandem links, eight suspension brackets and 80 tie-down clevises as shown in Figure 3-63.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

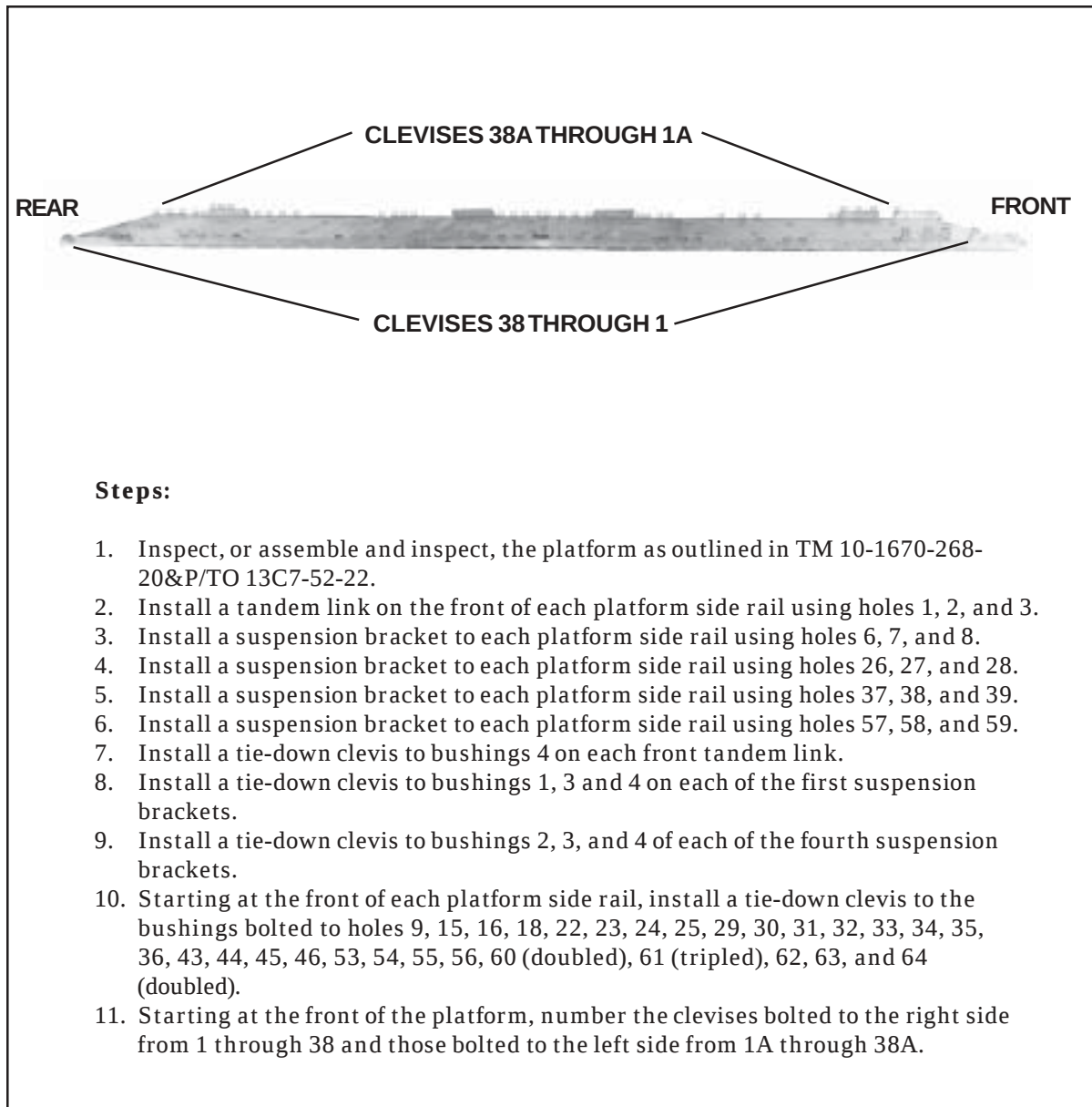


Figure 3-63. Platform Prepared

PREPARING HONEYCOMB

3-72. Build honeycomb stacks as shown in Figure 3-64.

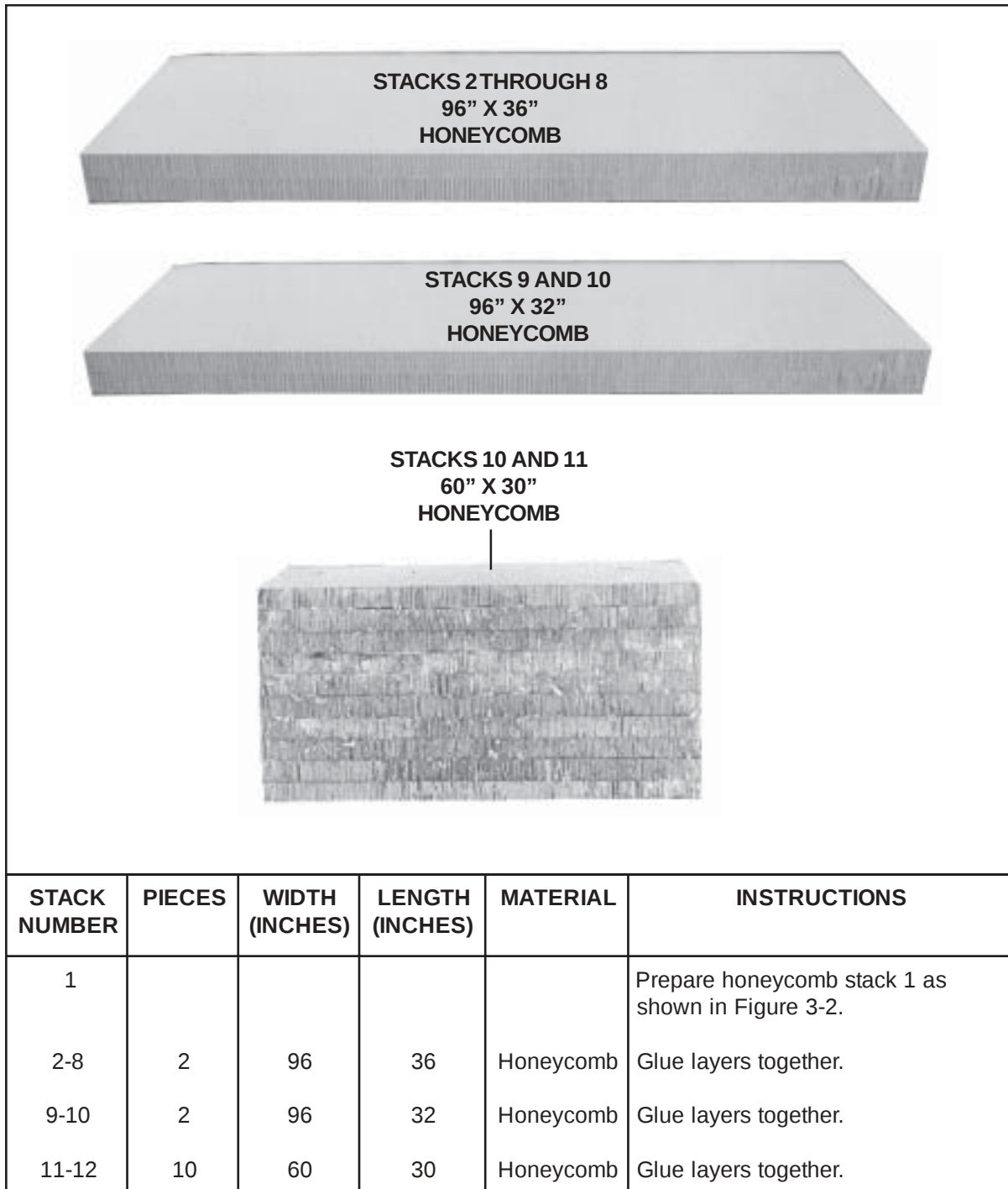


Figure 3-64. Honeycomb Stacks Prepared

POSITIONING HONEYCOMB STACKS

3-73. Position honeycomb stacks as shown in Figure 3-65.

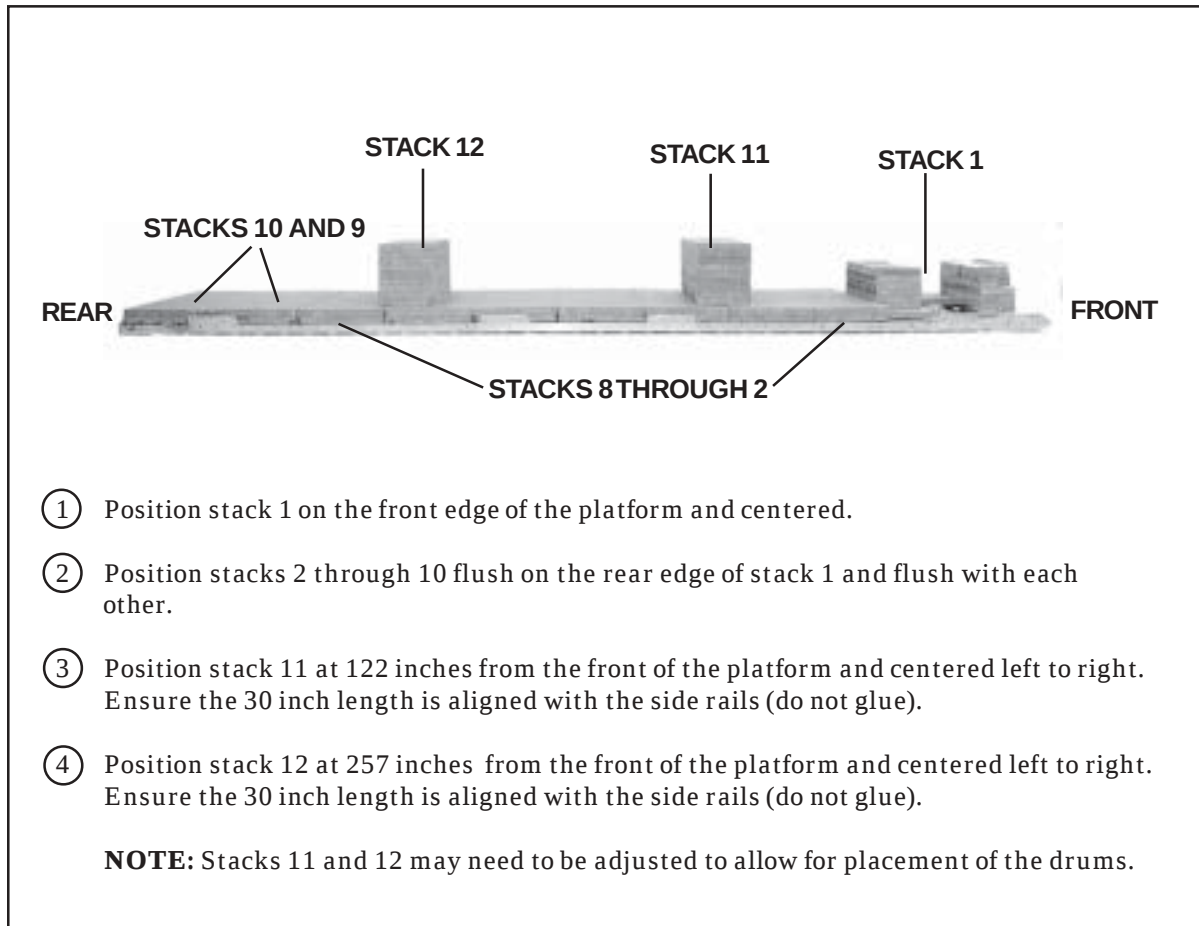


Figure 3-65. Honeycomb Stacks Positioned

BUILDING EQUIPMENT HOSE BOX

3-74. Build the equipment box as shown in Figure 3-5.

POSITIONING EQUIPMENT HOSE BOX

3-75. Position the equipment hose box as shown in Figure 3-6.

STORING EQUIPMENT IN THE EQUIPMENT HOSE BOX

3-76. Store the equipment in the equipment hose box as shown in Figure 3-7.

LASHING EQUIPMENT HOSE BOX TO PLATFORM

3-77. Lash the equipment hose box to the platform as shown in Figures 3-66 and 3-67.

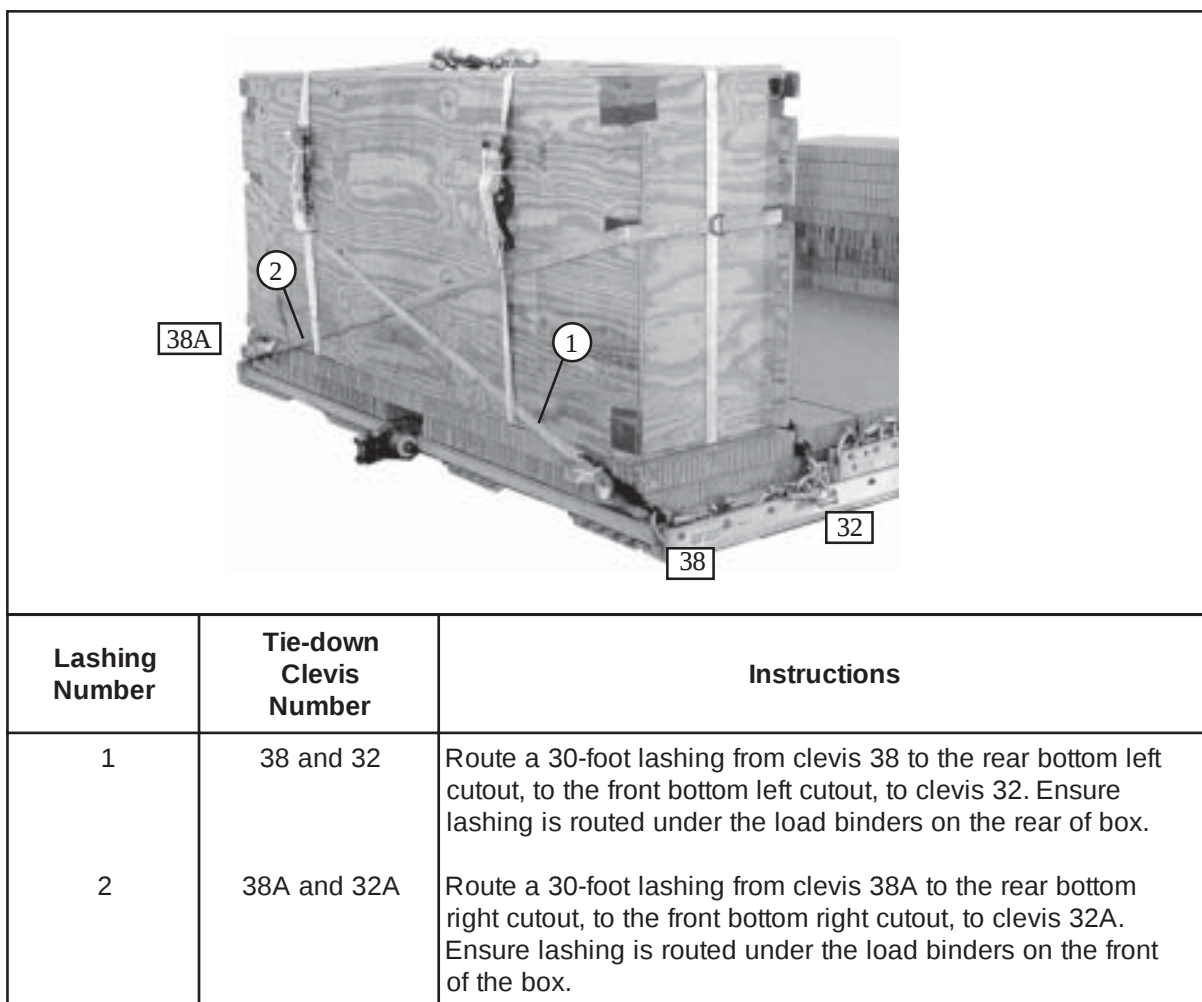
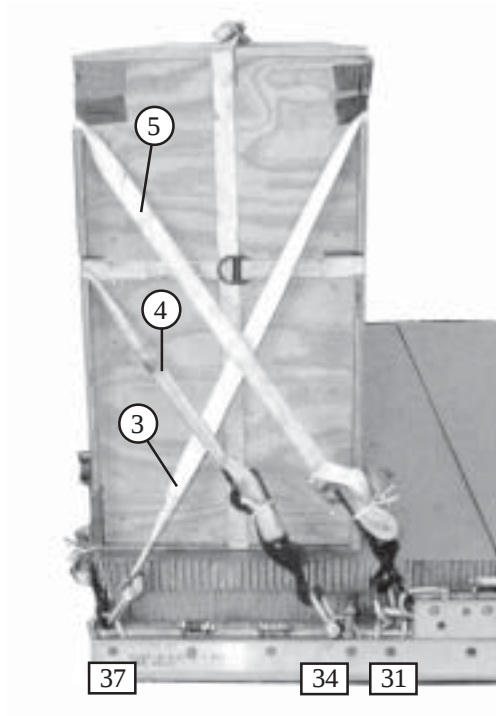


Figure 3-66. Lashings 1 and 2 Installed

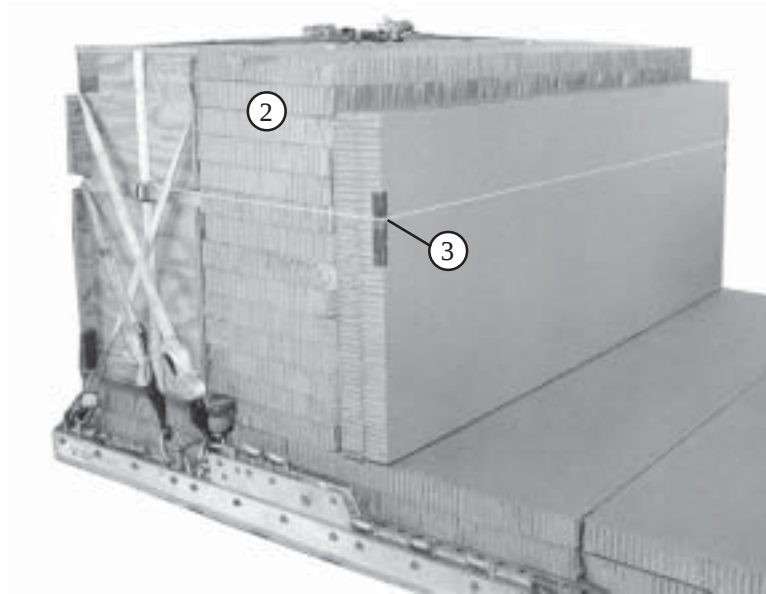


Lashing Number	Tie-down Clevis Number	Instructions
3	37 and 37A	Route a lashing through clevis 37 and back through it's own D-ring. Repeat for clevis 37A. Route lashings through top front cutouts and load bind in center of equipment box.
4	34A and 34	Route a lashing through clevis 34A and back through it's own D-ring to the bottom rear cutouts to clevis 34.
5	31A and 31	Route a 30-foot lashing through the rear top cutouts and load bind to clevises 31 and 31A.

Figure 3-67. Lashings 3, 4, and 5 Installed

POSITIONING AND SECURING PARACHUTE STACK

3-78. Position and secure parachute stack as shown in Figure 3-68.



- ① Cut 14 pieces of 96-inch by 18-inch honeycomb and glue them together.
- ② Position the parachute stack flush against the front of the equipment hose box.
- ③ Place two pieces of 96-inch by 36-inch honeycomb on edge in front of the parachute stack. Tape the edge and secure with type III nylon cord.

Figure 3-68. Parachute Stack Positioned

POSITIONING AND LASHING THE DRUMS

3-79. Position and lash the drums as shown in Figures 3-69 through 3-77.

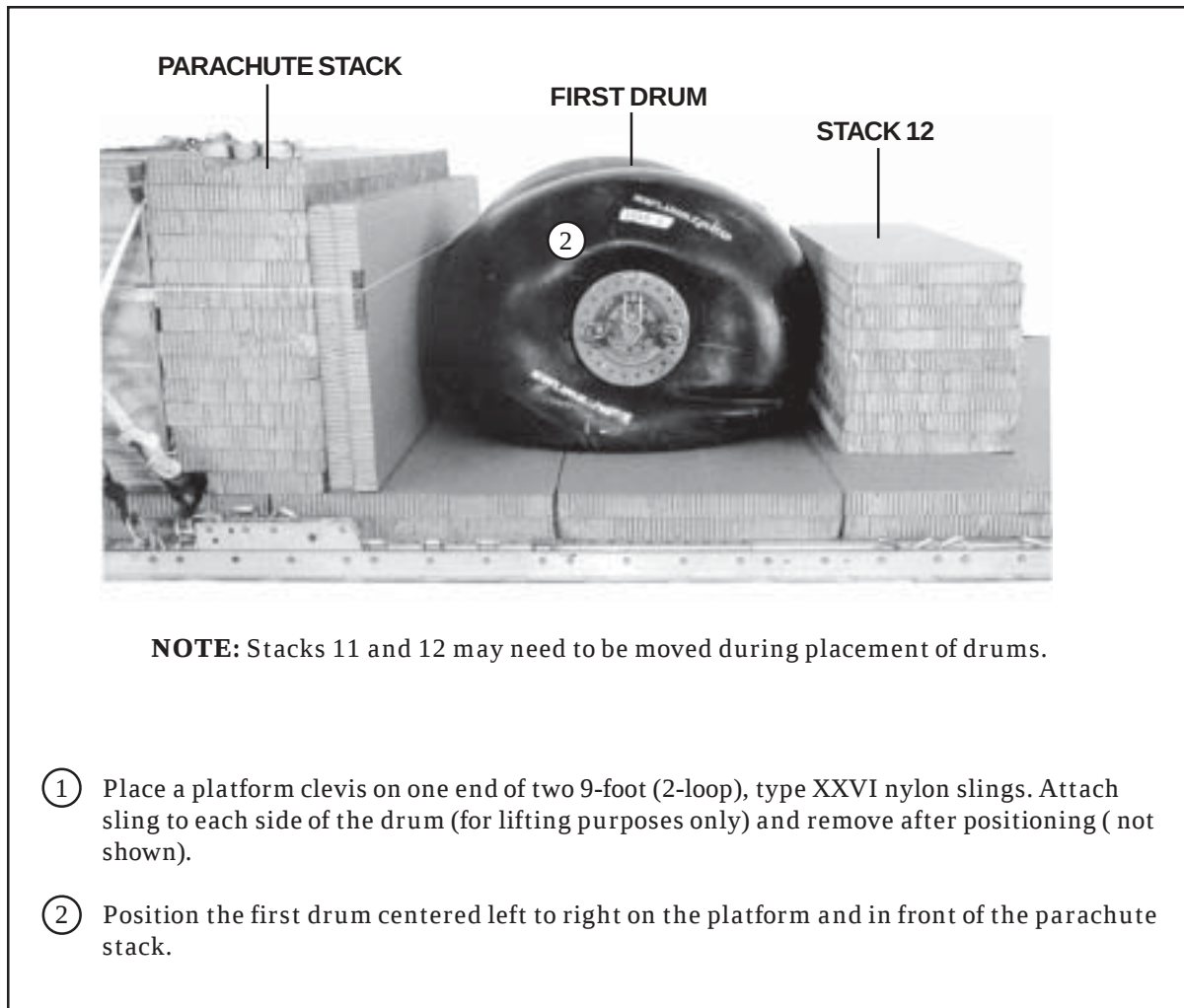


Figure 3-69. Drums Positioned on Platform

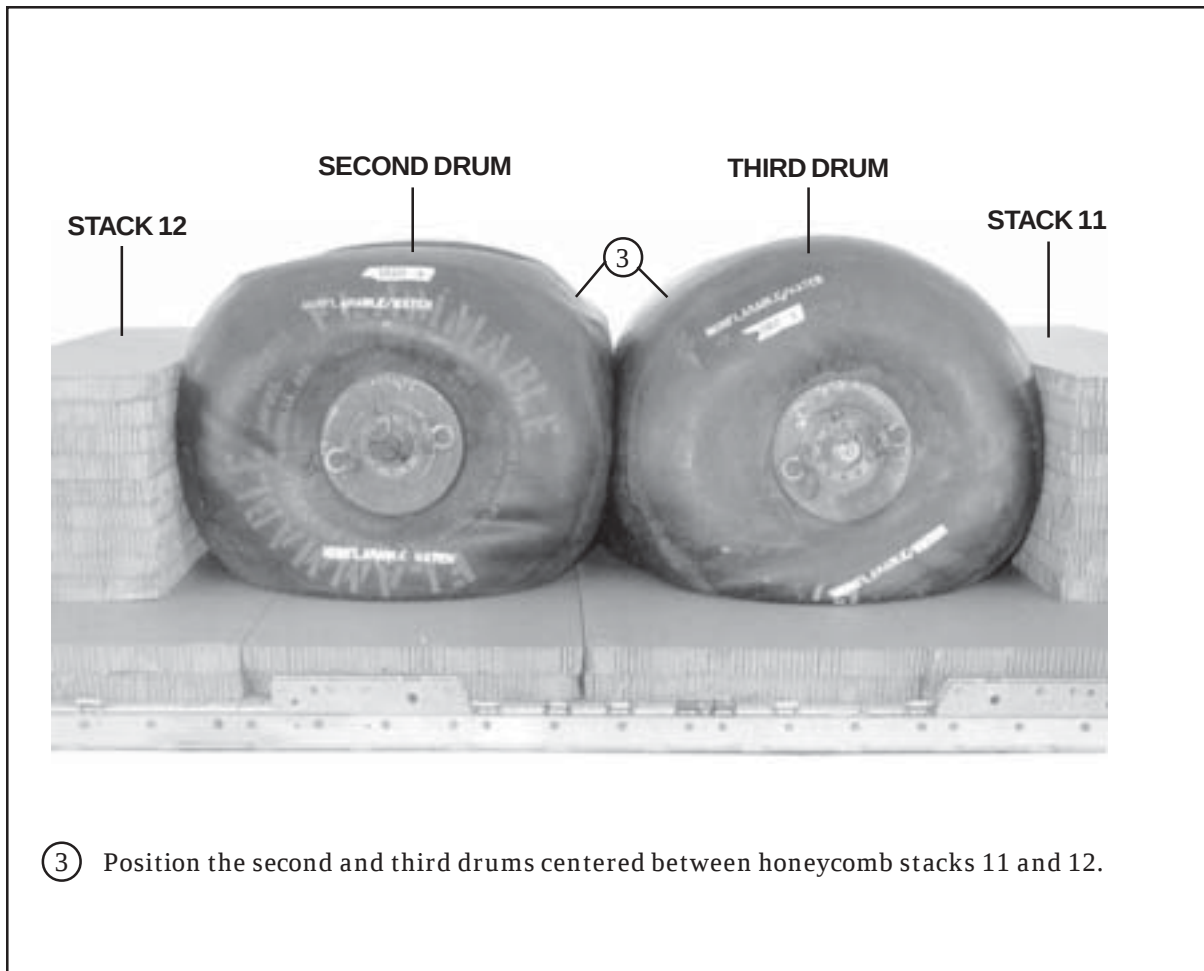


Figure 3-69. Drums Positioned on Platform (Continued)

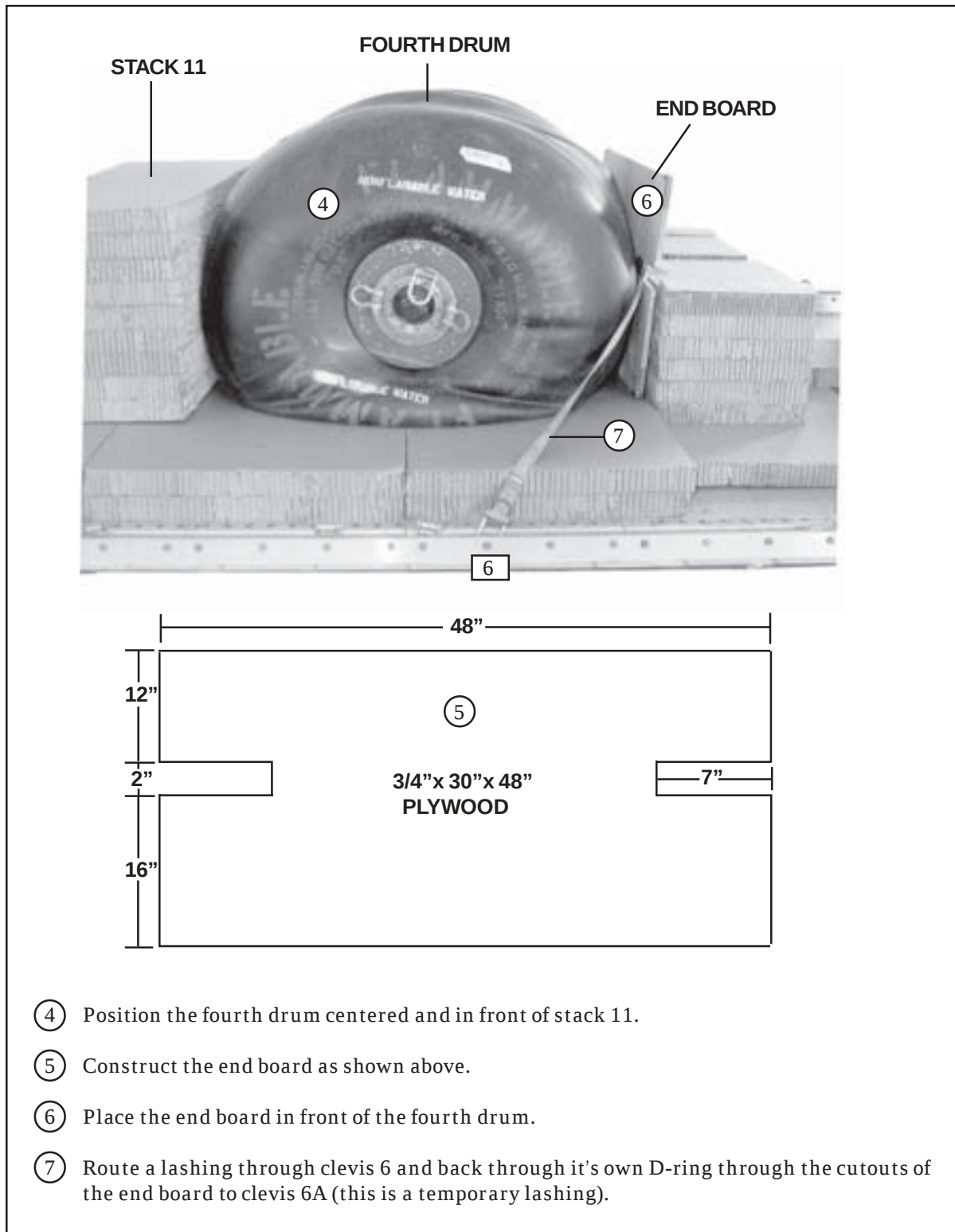


Figure 3-69. Drums Positioned on Platform (Continued)

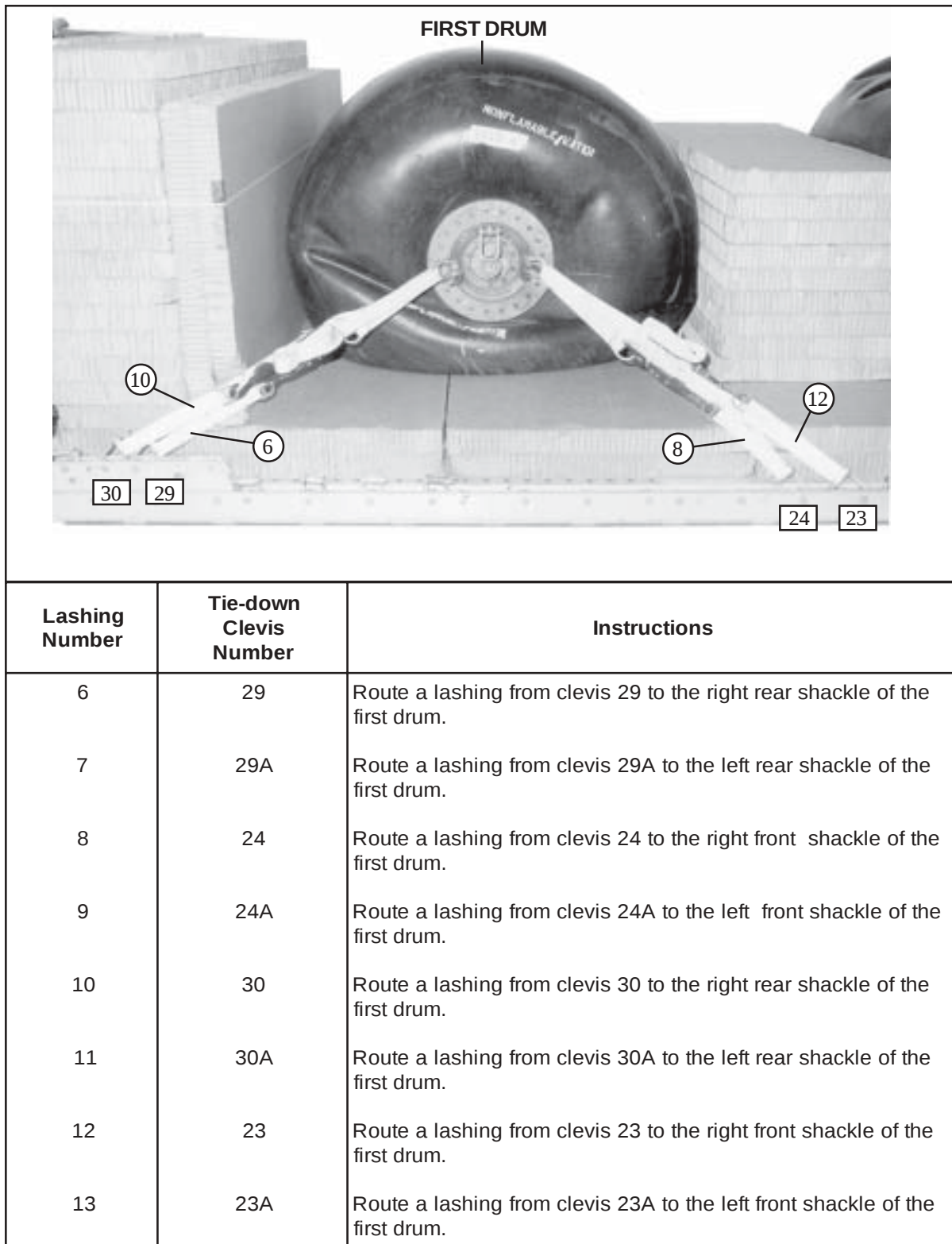


Figure 3-70. Lashings 6 Through 13 Installed

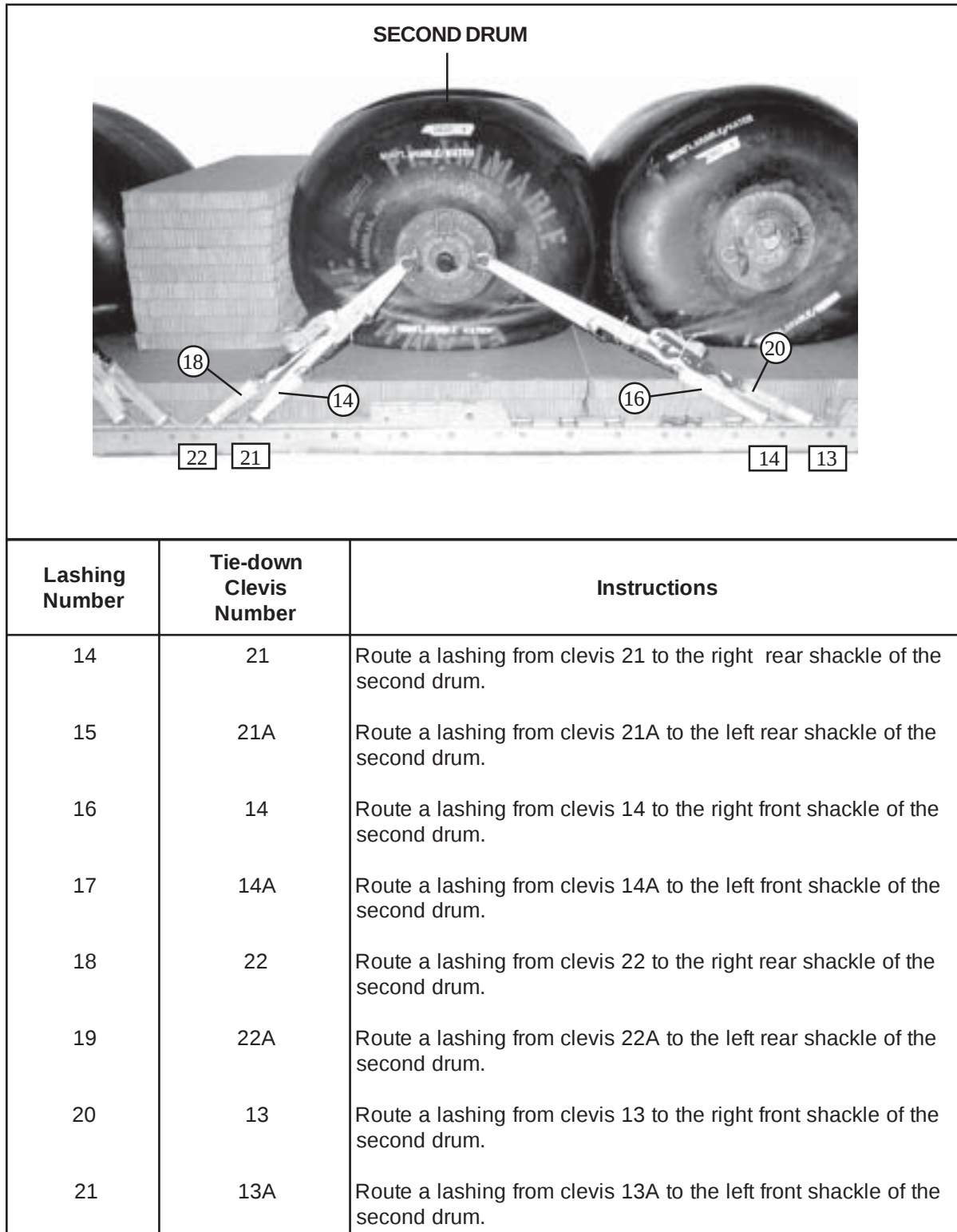


Figure 3-71. Lashings 14 Through 21 Installed

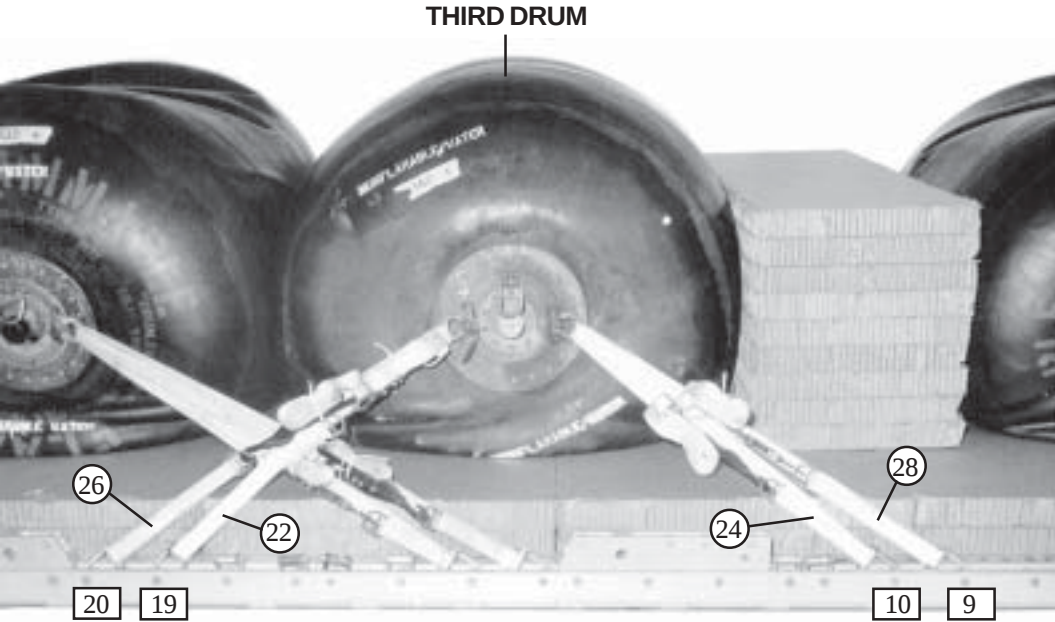
		
Lashing Number	Tie-down Clevis Number	Instructions
22	19	Route a lashing from clevis 19 to the right rear shackle of the third drum.
23	19A	Route a lashing from clevis 19A to the left rear shackle of the third drum.
24	10	Route a lashing from clevis 10 to the right front shackle of the third drum.
25	10A	Route a lashing from clevis 10A to the left front shackle of the third drum.
26	20	Route a lashing from clevis 20 to the right rear shackle of the third drum.
27	20A	Route a lashing from clevis 20A to the left rear shackle of the third drum.
28	9	Route a lashing from clevis 9 to the right front shackle of the third drum.
29	9A	Route a lashing from clevis 9A to the left front shackle of the third drum.

Figure 3-72. Lashings 22 Through 29 Installed

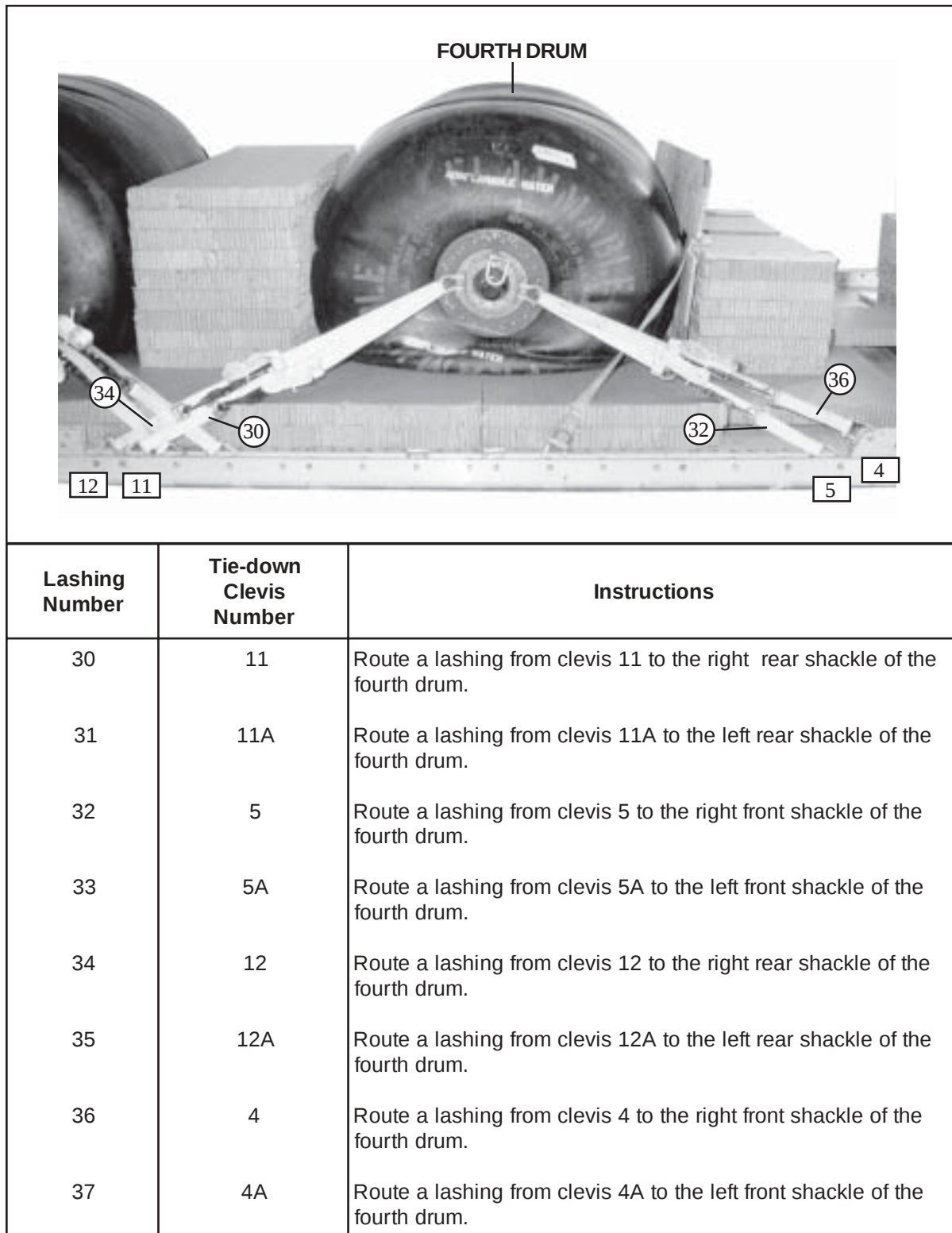
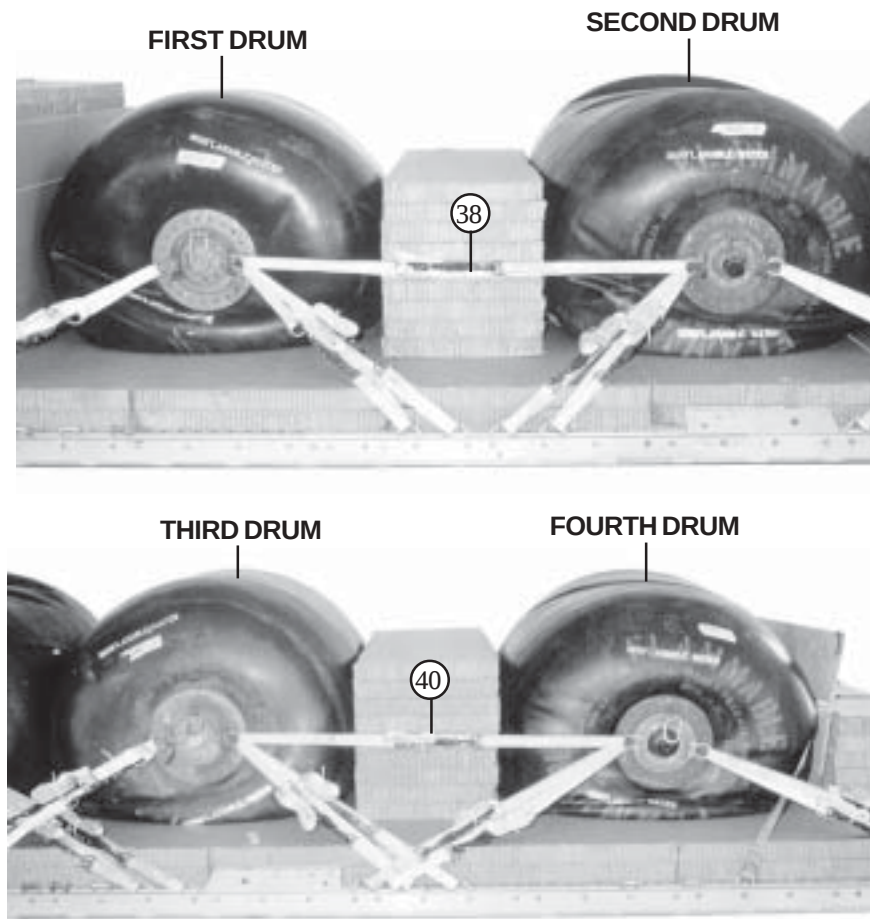
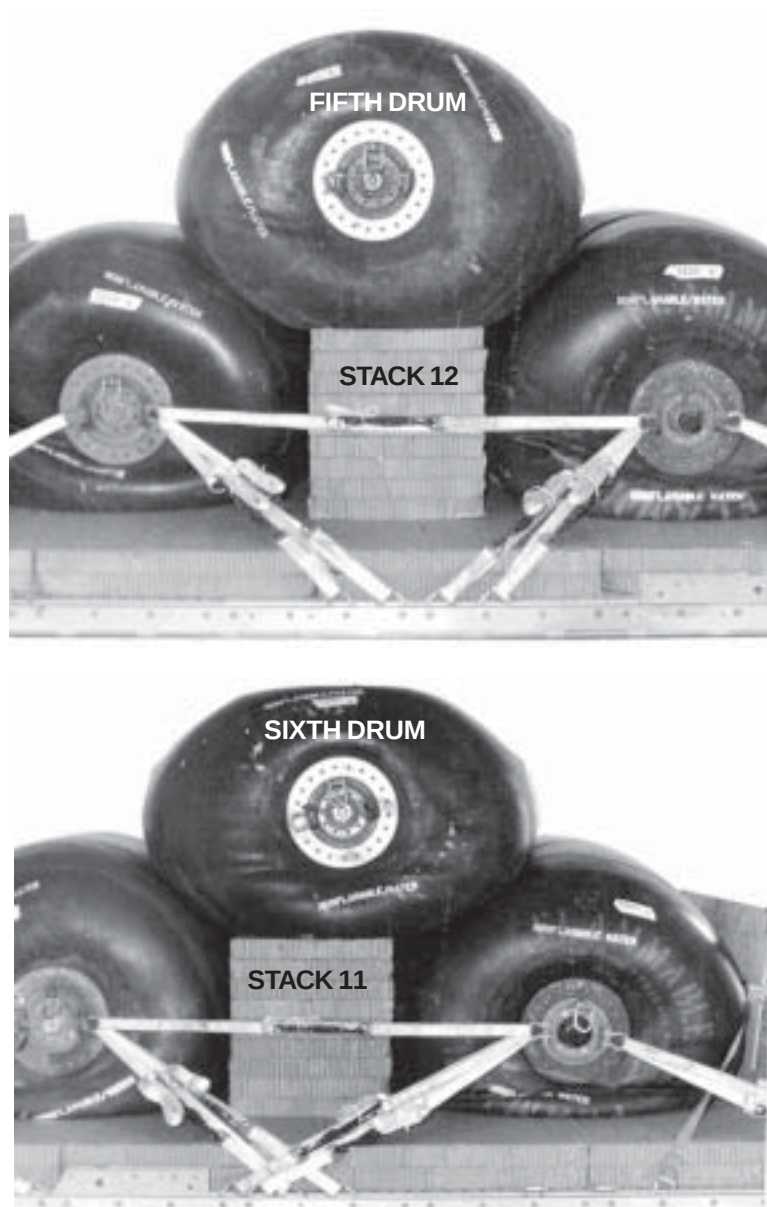


Figure 3-73. Lashings 30 Through 37 Installed



Lashing Number	Tie-down Clevis Number	Instructions
38		Route a lashing from the front shackle of the first drum to the rear shackle of the second drum on the right side.
39		Route a lashing from the front shackle of the first drum to the rear shackle of the second drum on the left side.
40		Route a lashing from the front shackle of the third drum to the rear shackle of the fourth drum on the right side.
41		Route a lashing from the front shackle of the third drum to the rear shackle of the fourth drum on the left side.

Figure 3-74. Lashings 38 Through 41 Installed



- ① Position the fifth drum centered on top of stack 12.
- ② Position the sixth drum centered on top of stack 11.

Figure 3-75. Drums Positioned on Platform

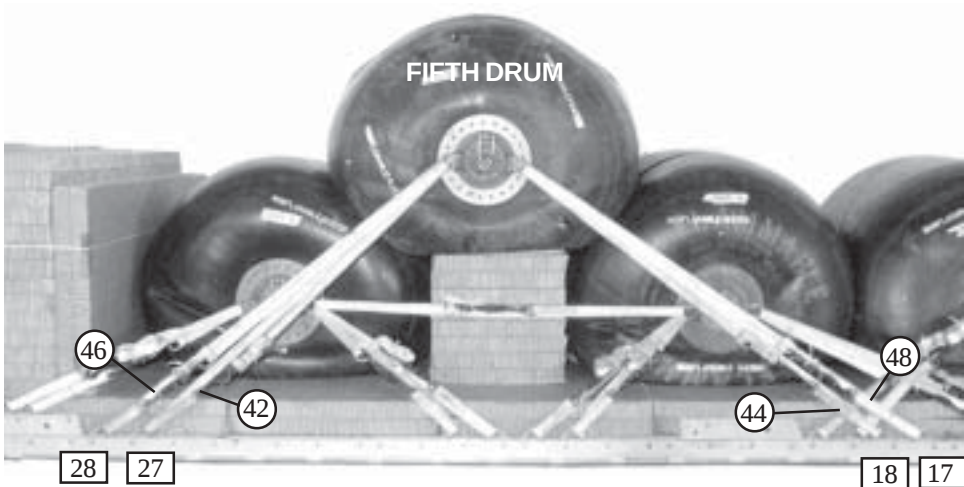
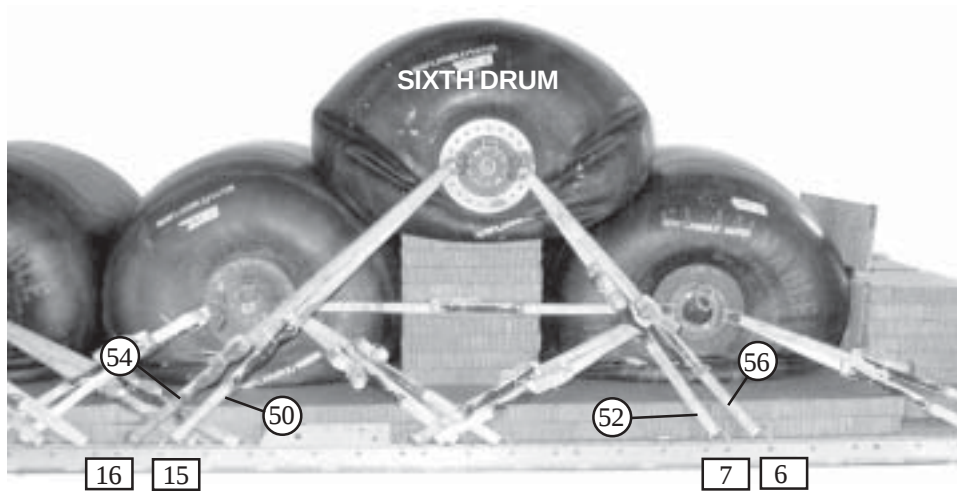
		
Lashing Number	Tie-down Clevis Number	Instructions
42	27	Route a lashing from clevis 27 to the right rear shackle of the fifth drum.
43	27A	Route a lashing from clevis 27A to the left rear shackle of the fifth drum.
44	18	Route a lashing from clevis 18 to the right front shackle of the fifth drum.
45	18A	Route a lashing from clevis 18A to the left front shackle of the fifth drum.
46	28	Route a lashing from clevis 28 to the right rear shackle of the fifth drum.
47	28A	Route a lashing from clevis 28A to the left rear shackle of the fifth drum.
48	17	Route a lashing from clevis 17 to the right front shackle of the fifth drum.
49	17A	Route a lashing from clevis 17A to the left front shackle of the fifth drum.

Figure 3-76. Lashings 42 Through 49 Installed



NOTE: Remove the temporary end board lashing on clevises 6 and 6A.

Lashing Number	Tie-down Clevis Number	Instructions
50	15	Route a lashing from clevis 15 to the right rear shackle of the sixth drum.
51	15A	Route a lashing from clevis 15A to the left rear shackle of the sixth drum.
52	7	Route a lashing from clevis 7 to the right front shackle of the sixth drum.
53	7A	Route a lashing from clevis 7A to the left front shackle of the sixth drum.
54	16	Route a lashing from clevis 16 to the right rear shackle of the sixth drum.
55	16A	Route a lashing from clevis 16A to the left rear shackle of the sixth drum.
56	6	Route a lashing from clevis 6 to the right front shackle of the sixth drum.
57	6A	Route a lashing from clevis 6A to the left front shackle of the sixth drum.

Figure 3-77. Lashings 50 Through 57 Installed

PREPARING AND POSITIONING THE PUMP

3-80. Prepare the pump as shown in Figure 2-8. Position the pump as shown in Figure 3-78.

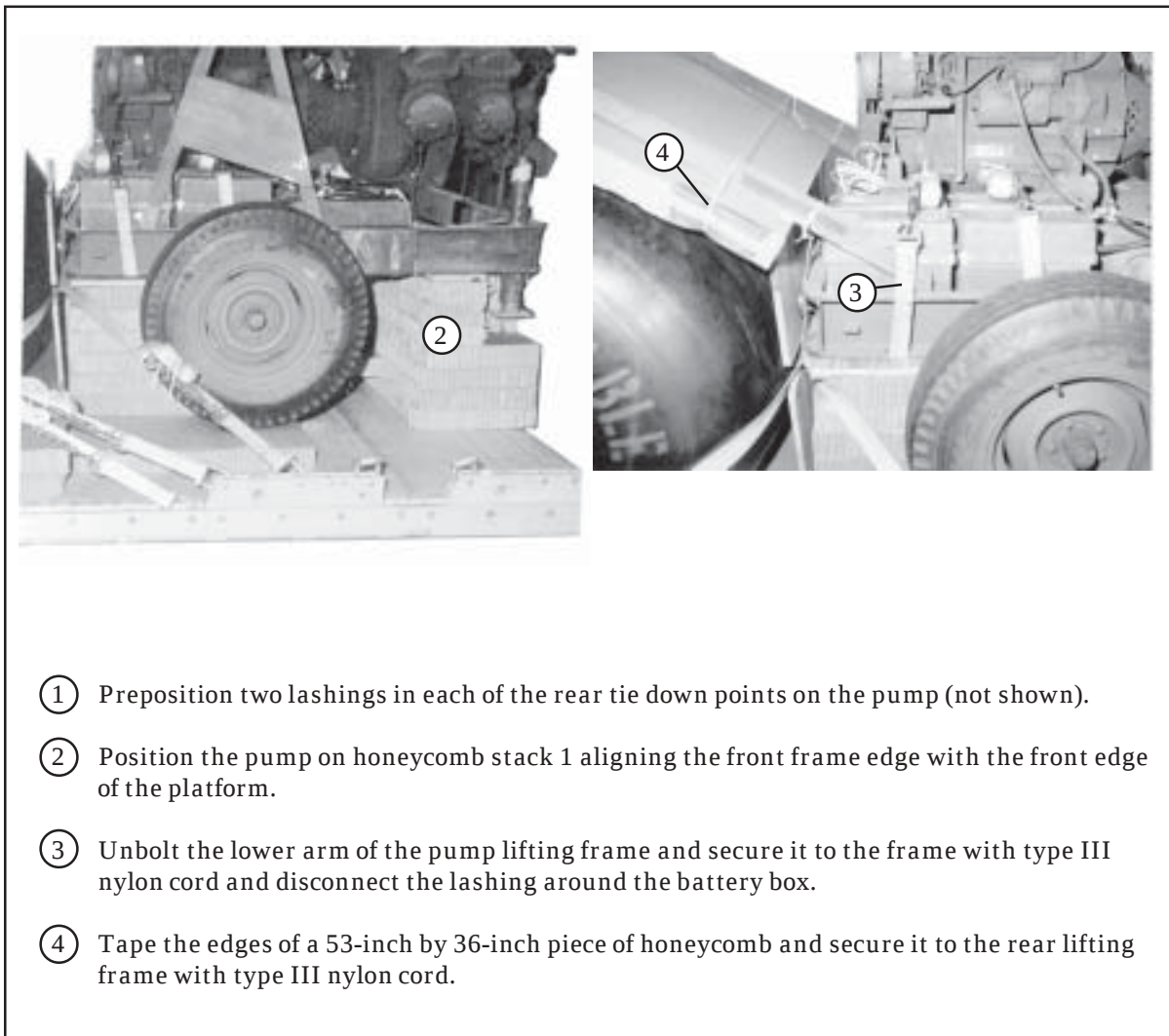
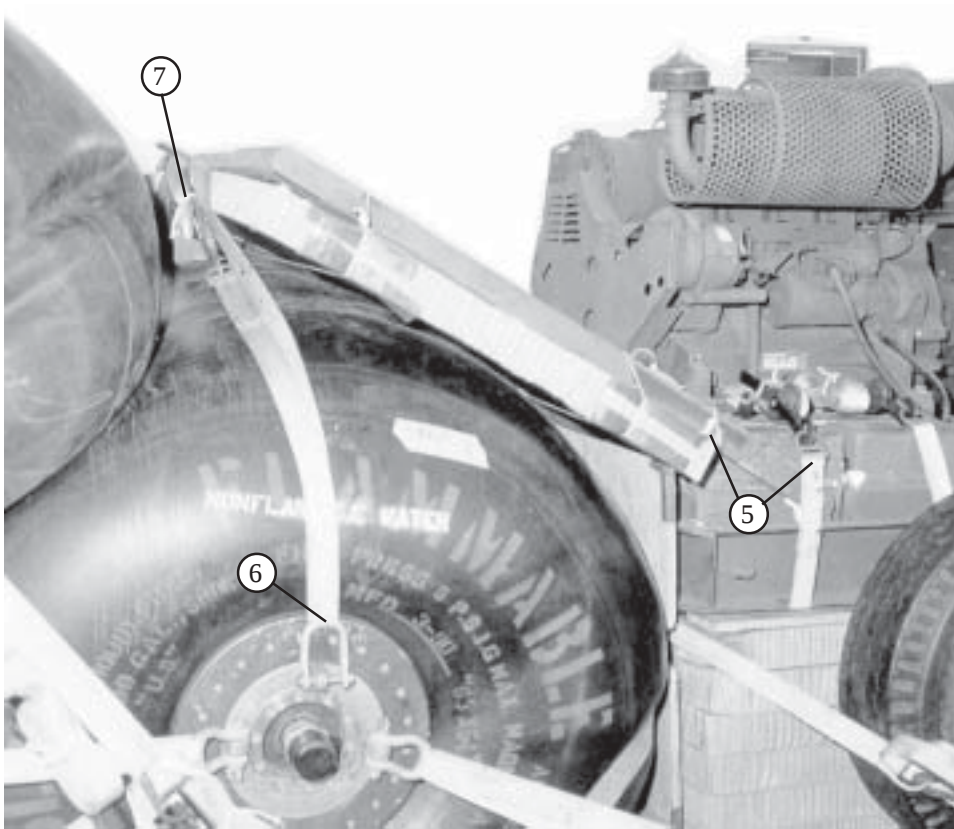


Figure 3-78. Pump Prepared and Positioned

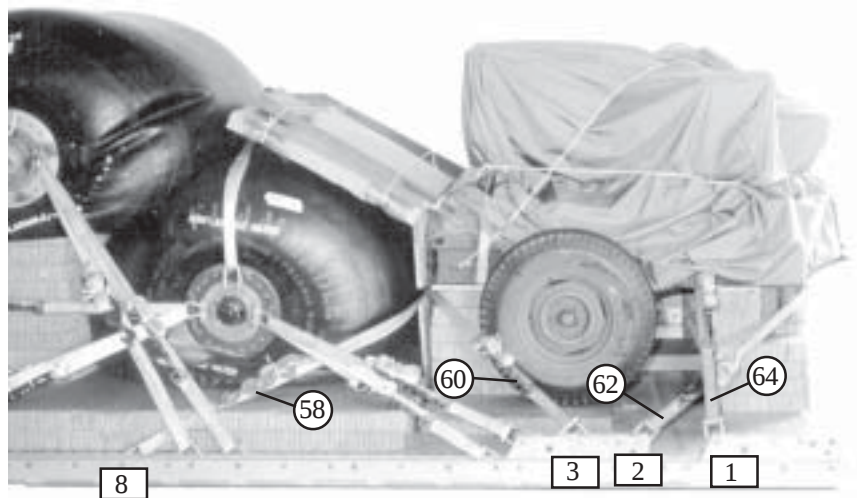


- ⑤ Position the lifting frame on the fourth drum and reconnect the lashing around the battery box.
- ⑥ Route a lashing through the top right shackle on the fourth drum over and through the lifting point on the frame. Continue to route the same lashing through the top left shackle on the fourth drum back over and through the lifting point on the frame. Secure the load binder and D-ring.
- ⑦ Secure a piece of felt on the lifting point with type III nylon cord.
- ⑧ Secure a canvas cover over the pump and secure with type III nylon cord (not shown).

Figure 3-78. Pump Prepared and Positioned (Continued)

LASHING PUMP TO PLATFORM

3-81. Lash the pump to the platform as shown in Figure 3-79.



Lashing Number	Tie-down Clevis Number	Instructions
58	8	Route the prepositioned lashing from the right rear tiedown point through the cutout in the endboard to clevis 8.
59	8A	Route a prepositioned lashing from the left rear tiedown point through the cutout in the endboard to clevis 8A.
60	3	Route a prepositioned lashing from the right rear tiedown point to clevis 3.
61	3A	Route a prepositioned lashing from the left rear tiedown point to clevis 3A.
62	2	Route a lashing from clevis 2 to the right front tiedown point.
63	2A	Route a lashing from clevis 2A to the left front tiedown point.
64	1	Route a lashing from clevis 1 to the right side frame.
65	1A	Route a lashing from clevis 1A to the left side frame.

Figure 3-79. Lashings 58 Through 65 Installed

BUILDING, POSITIONING, AND LASHING THE SEPARATOR BOX TO THE PLATFORM

3-82. Build the separator box as shown in Figure 3-80. Place the separator in the box as shown in Figure 3-81. Prepare, position, and lash the separator box as shown in Figures 3-82 and 3-83.

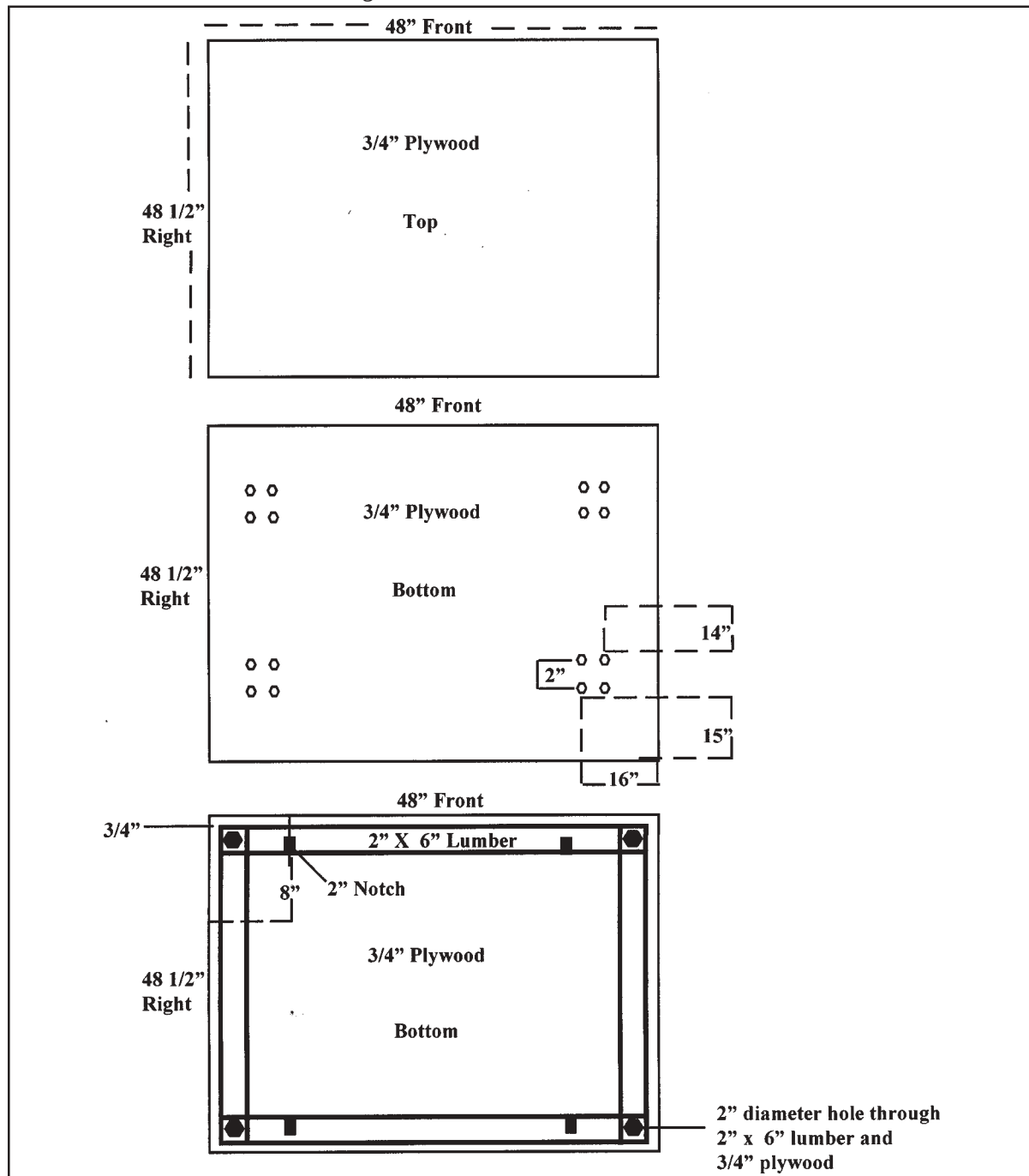


Figure 3-80. Separator Box Built

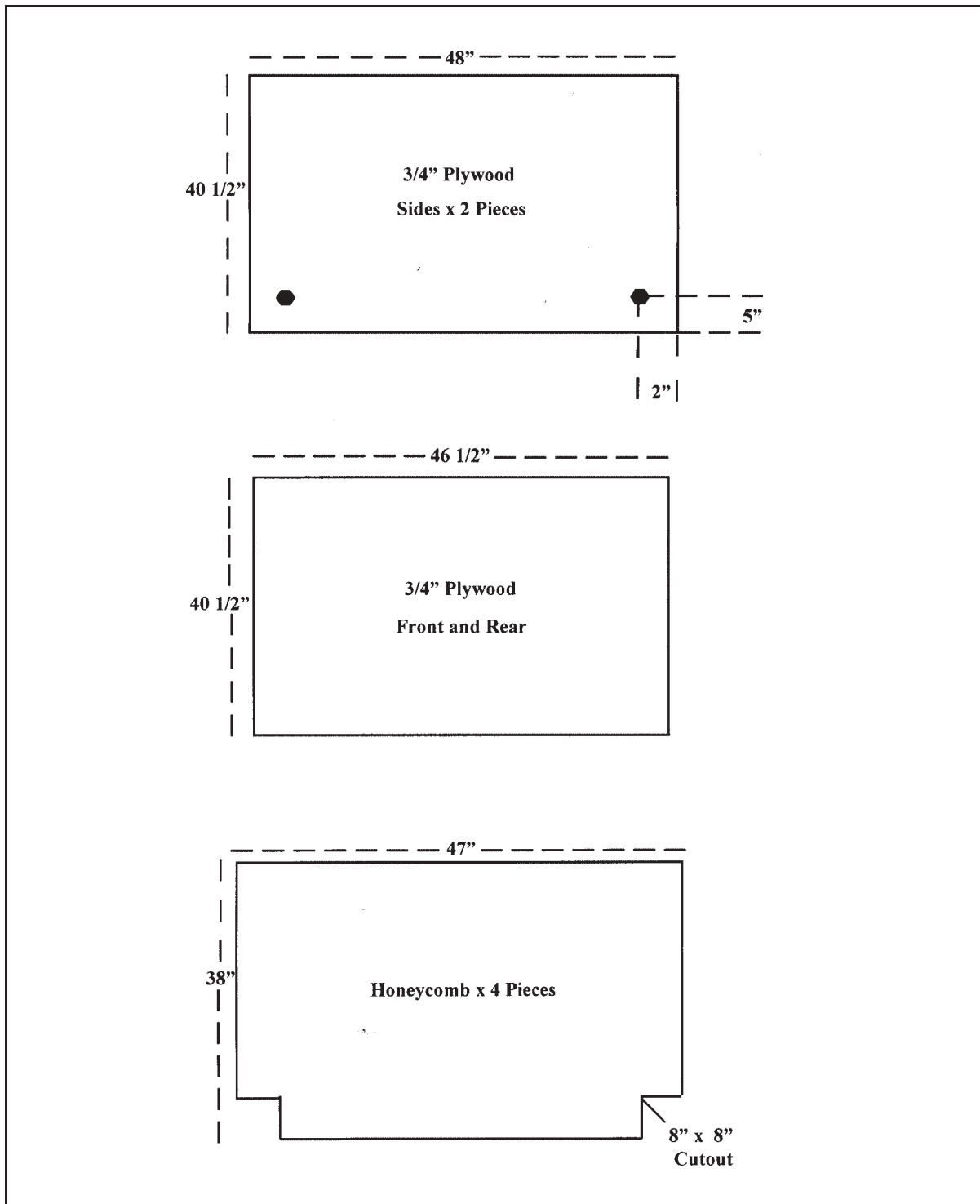


Figure 3-80. Separator Box Built (Continued)

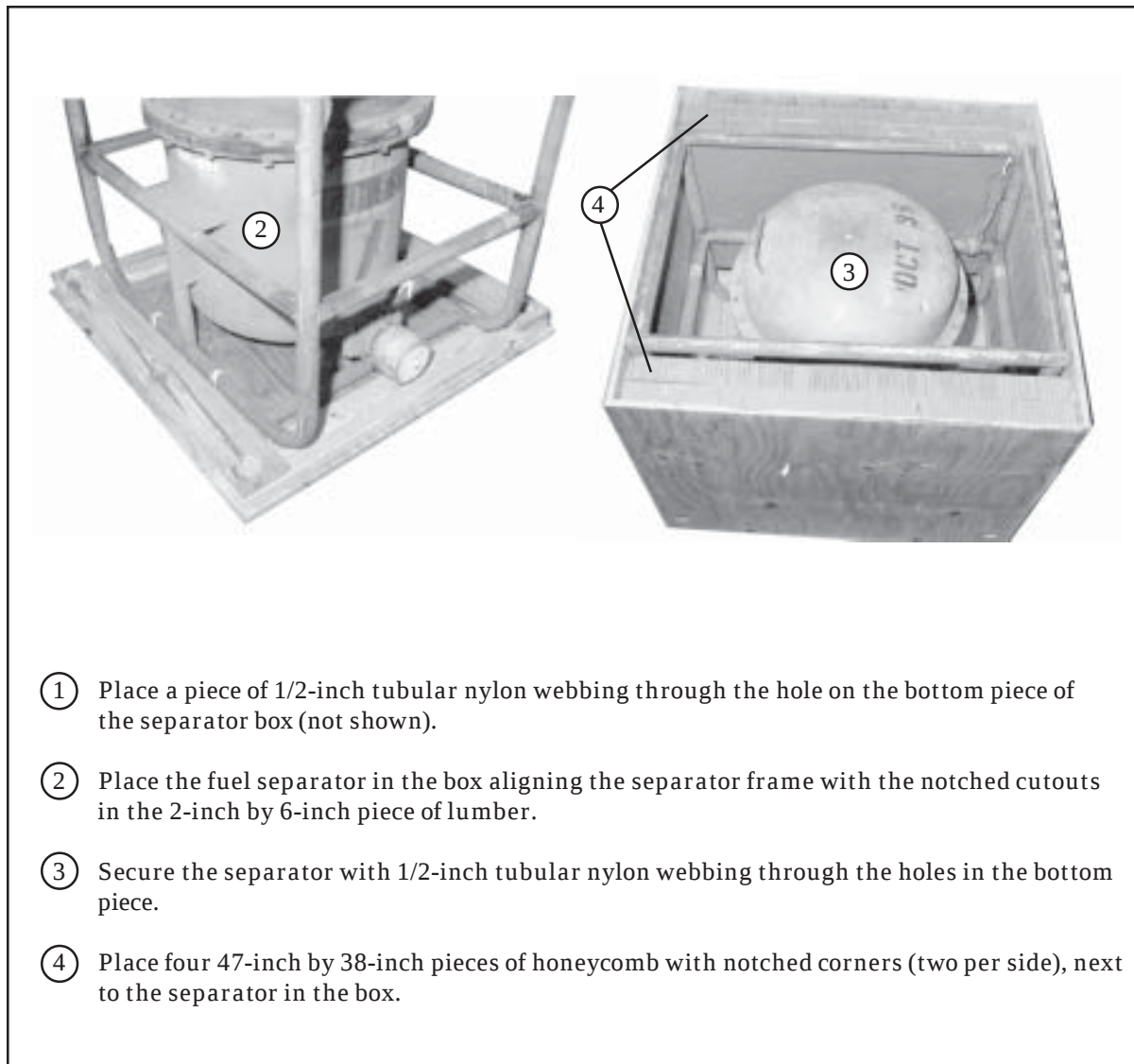
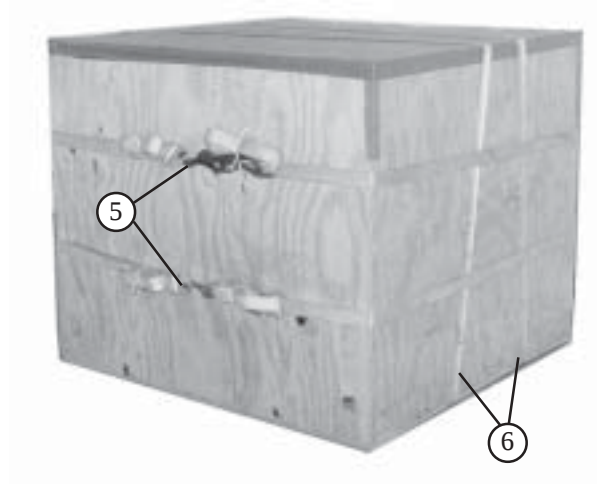
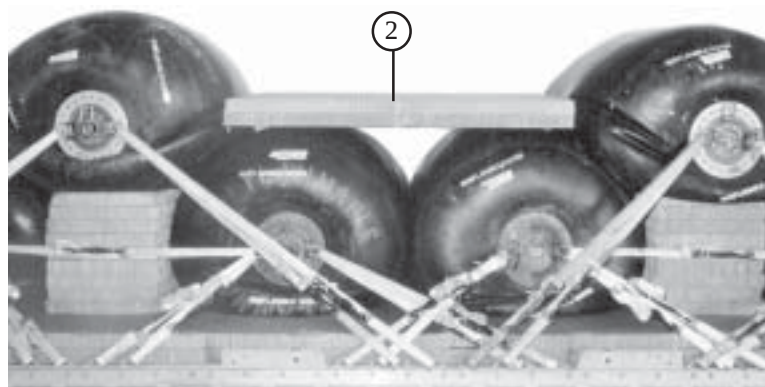


Figure 3-81. Separator Placed In Box



- ⑤ Use two lashings to secure the box. Place each lashing approximately 16 inches in from the top and bottom of the box.
- ⑥ Use two lashings to secure the box from front to rear. Place each lashing approximately 16 inches in from each side of the box.

Figure 3-81. Separator Placed In Box (Continued)

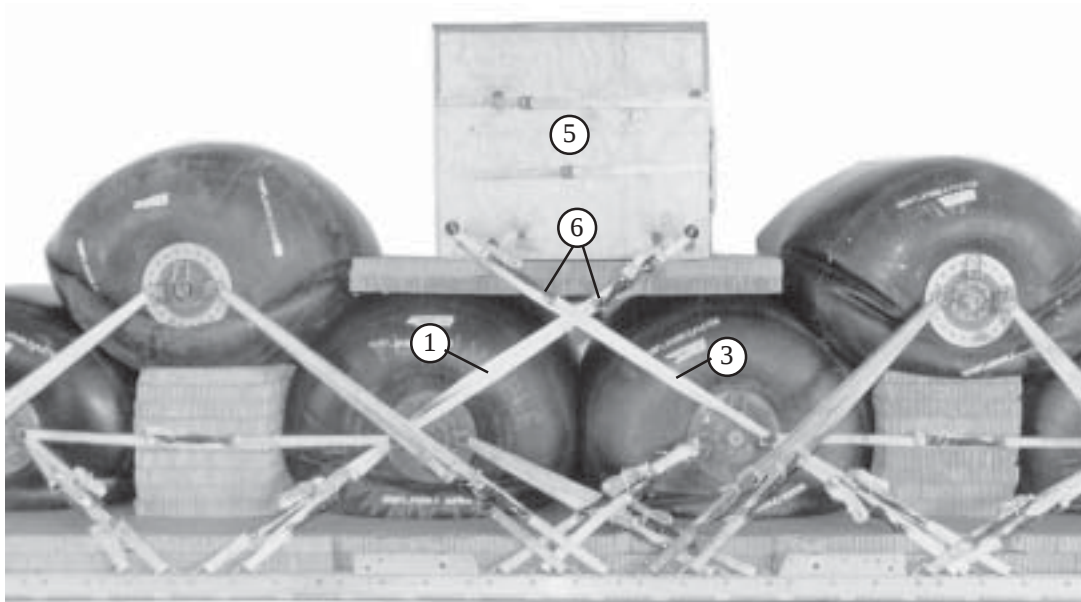


96"x 17" HONEYCOMB	96"x 36" HONEYCOMB
96"x 36" HONEYCOMB	
	96"x 17" HONEYCOMB

96"x 53" BASE

- ① Alternate two pieces of 96-inch by 36-inch honeycomb and two pieces of 17-inch by 36-inch honeycomb to make a two layer 96-inch by 53-inch base. Glue the layers together.
- ② Cut the stack to fit tightly between the fifth and sixth drums.

Figure 3-82. Honeycomb Stack for Separator Box Prepared



NOTE: The separator box must be suspended to complete the routing of the lashings.

- ① Route a lashing from the right rear shackle of the second drum up through the bottom right front hole and out the side right front hole of the box.
- ② Repeat step 1 for the left side.
- ③ Route a lashing from the right front shackle of the third drum up through the bottom right rear hole and out the side right rear hole of the box.
- ④ Repeat step 3 for the left side.
- ⑤ Lower and position the separator box centered on the honeycomb between the drums. Remove lifting slings.
- ⑥ Secure separator box lashings and safety tie the lower hooks of the load binders to the lower D-rings with a single length of type III nylon cord.

Figure 3-83. Separator Box Positioned and Secured to Load

CONSTRUCTING AND POSITIONING THE RELEASE PLATFORM

3-83. Construct and position the release platform as shown in Figure 3-84.

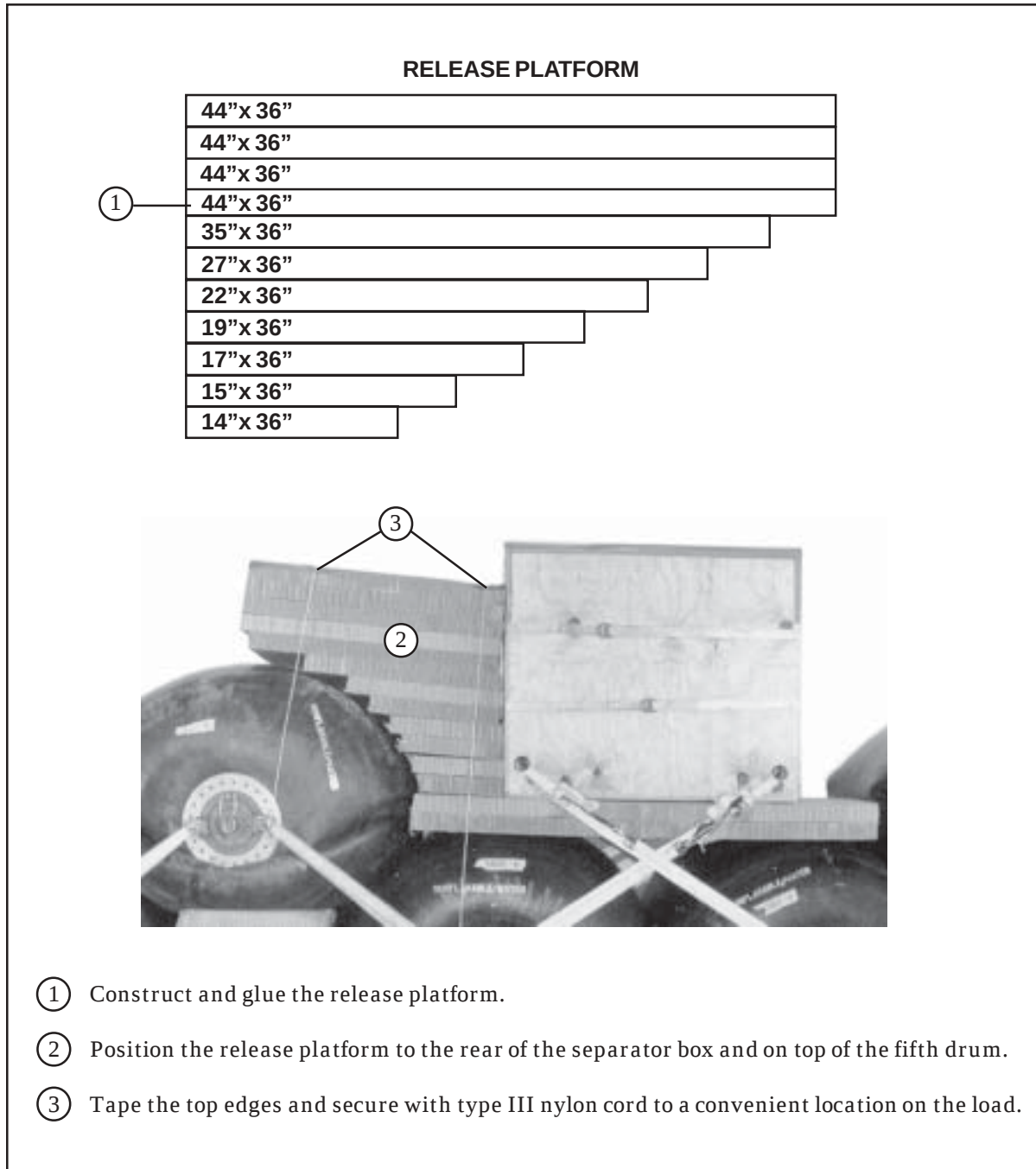


Figure 3-84. Release Platform Constructed and Positioned

INSTALLING SUSPENSION SLINGS AND SAFETY TIES

3-84. Install suspension slings and safety ties as shown in Figure 3-85.

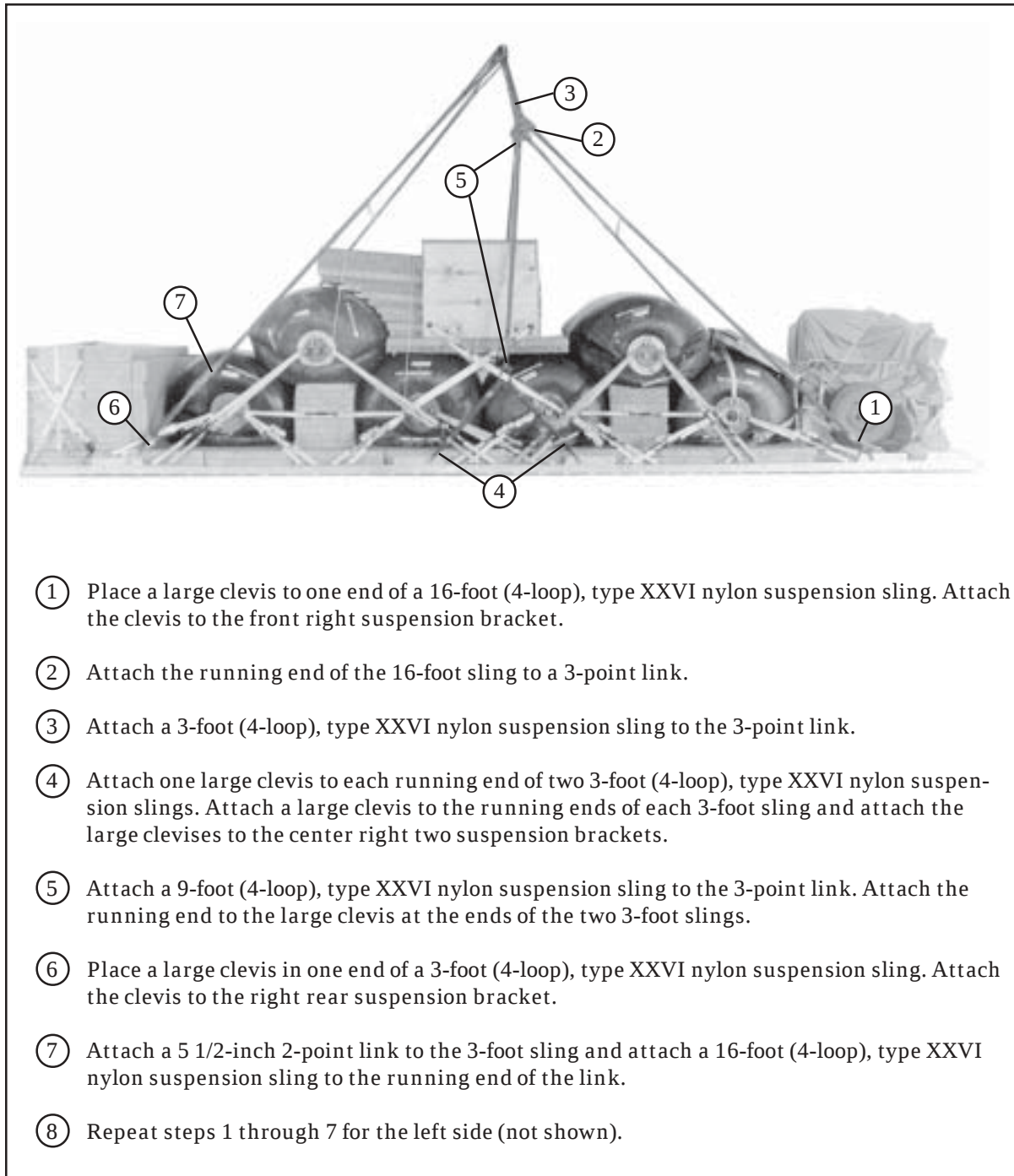


Figure 3-85. Suspension Slings and Safety Ties Installed

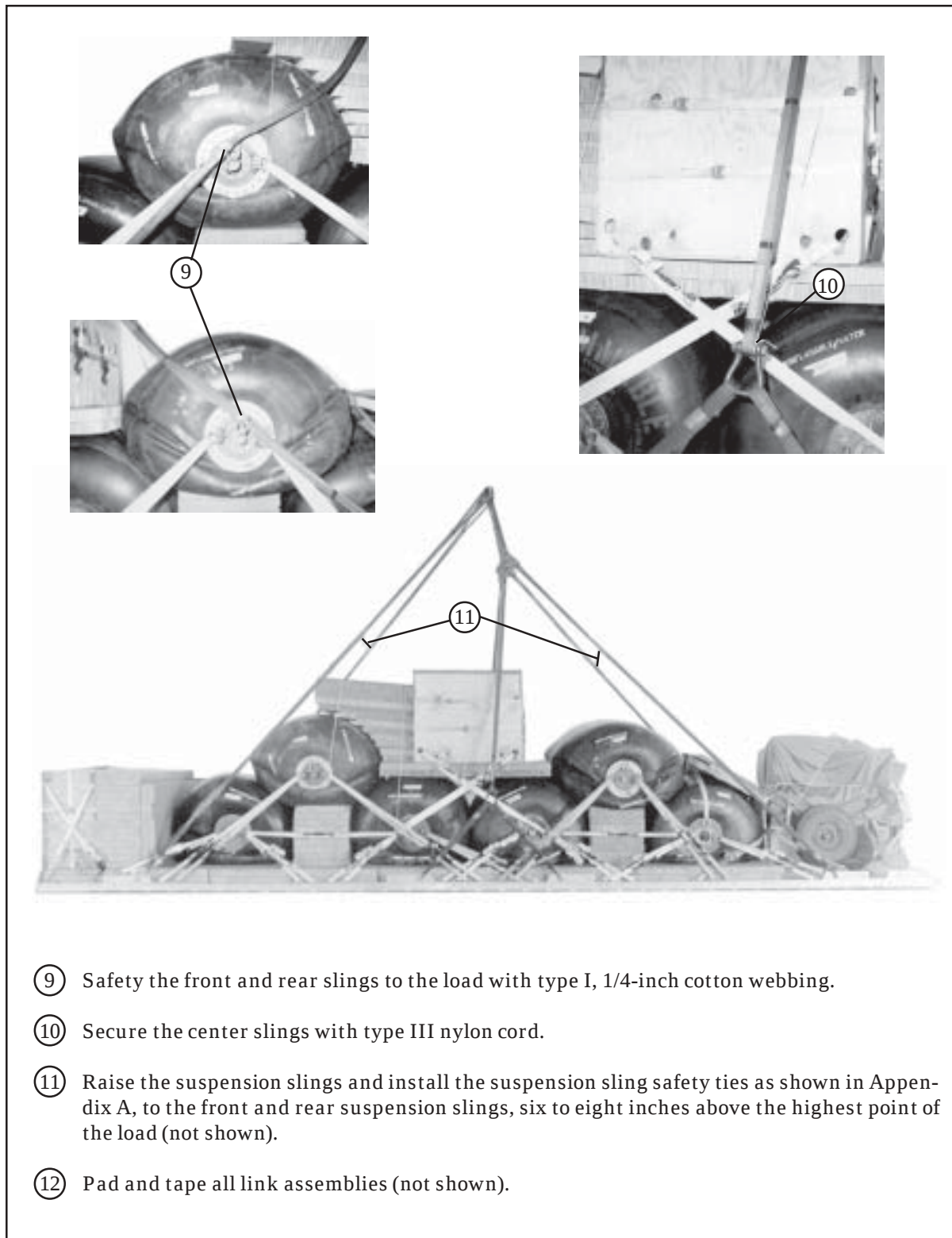


Figure 3-85. Suspension Slings and Safety Ties Installed (Continued)

BUILDING AND POSITIONING PARACHUTE STOWAGE PLATFORM

3-85. Build the parachute stowage platform as shown in Figure 3-18. Position a 85-inch by 17-inch piece of honeycomb on top of the parachute stack. Position the stowage platform on top of the equipment hose box and parachute stack. Lash the parachute stowage platform as shown in Figure 3-86.

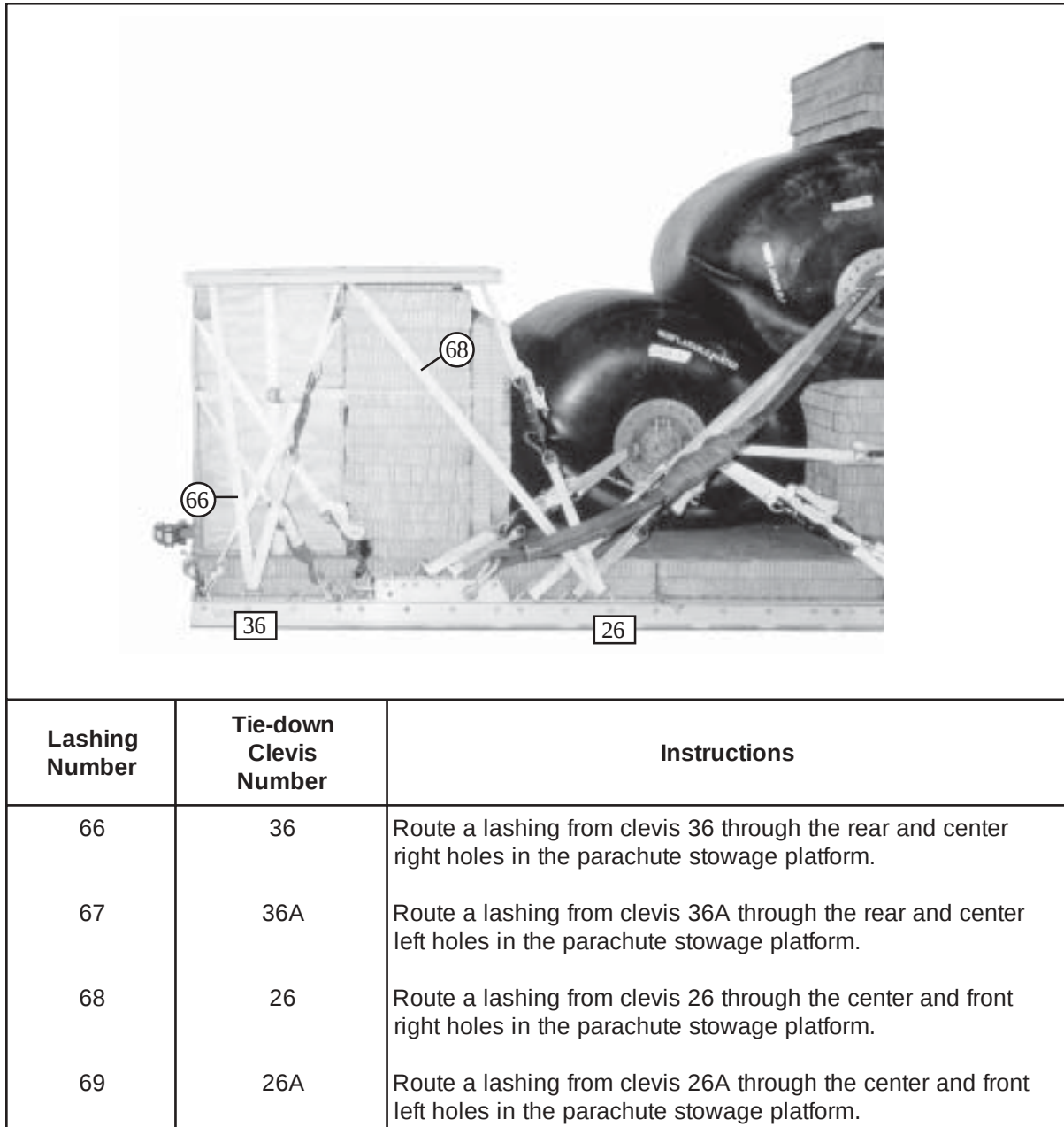


Figure 3-86. Parachute Stowage Platform Built and Positioned

PREPARING AND STOWING CARGO PARACHUTES

3-86. Prepare and stow the cargo parachutes as shown in Figure 3-87.

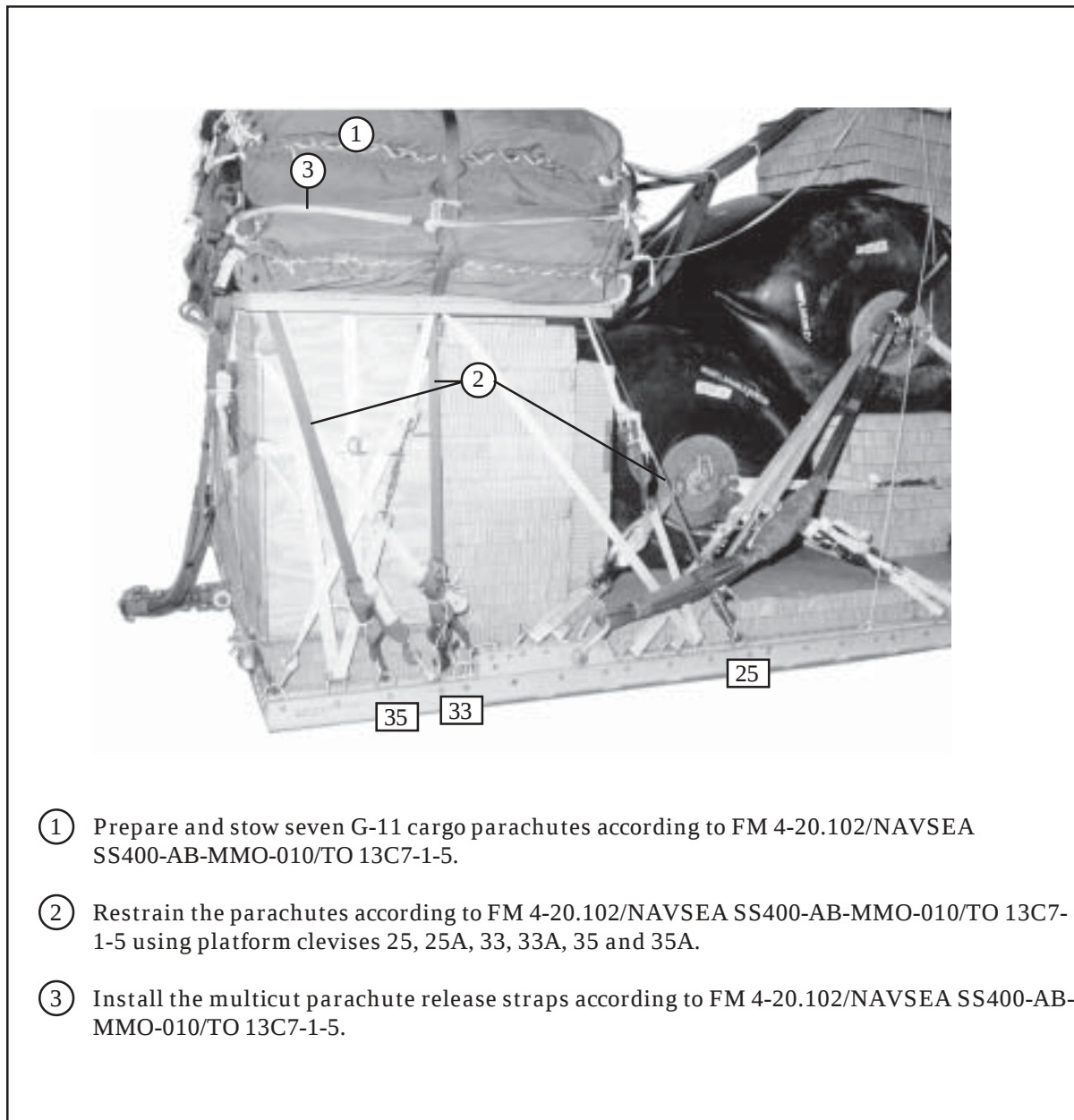


Figure 3-87. Cargo Parachutes Prepared and Stowed

INSTALLING THE EXTRACTION SYSTEM

3-87. Install the extraction system as shown in Figure 3-88.

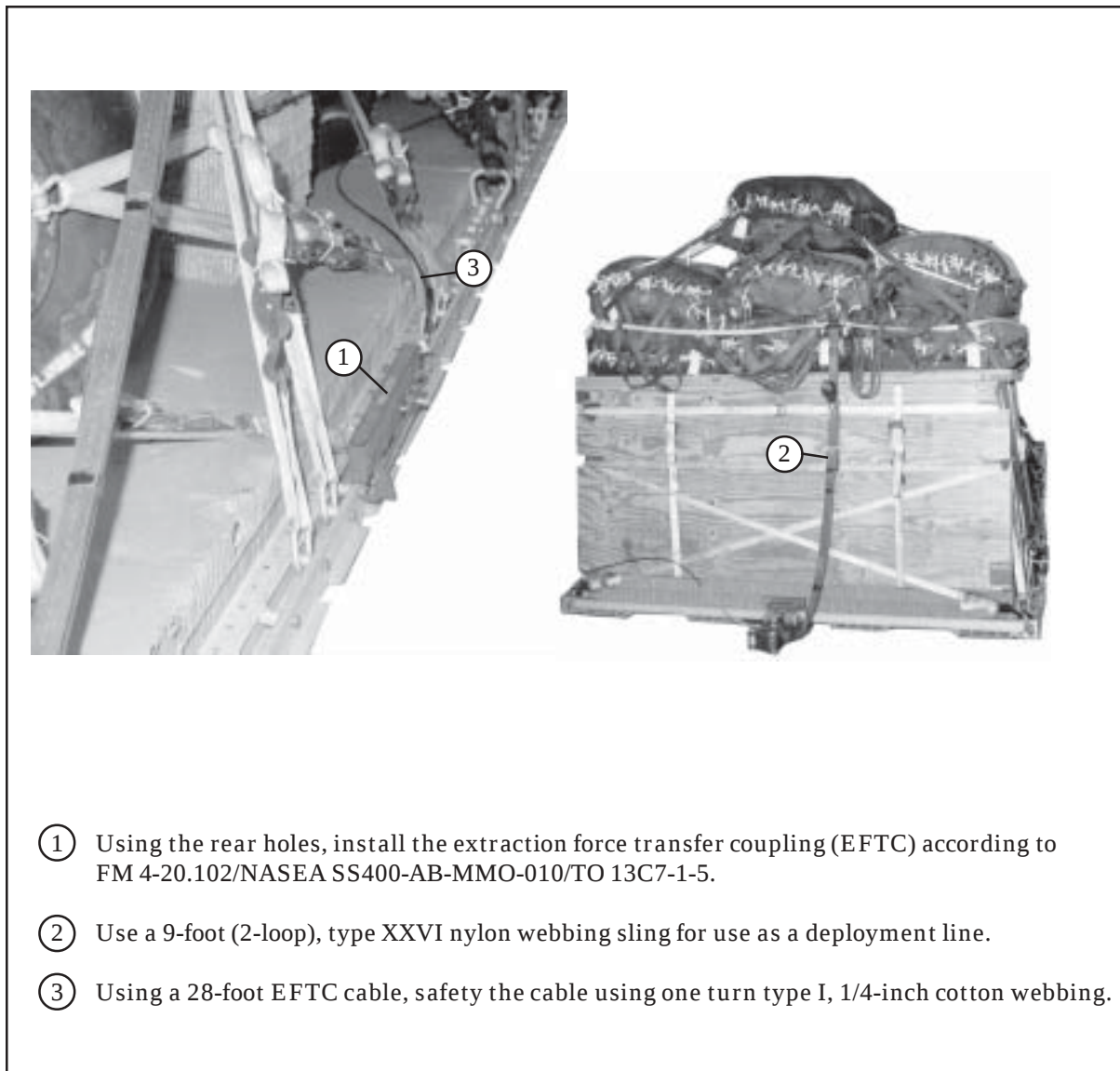
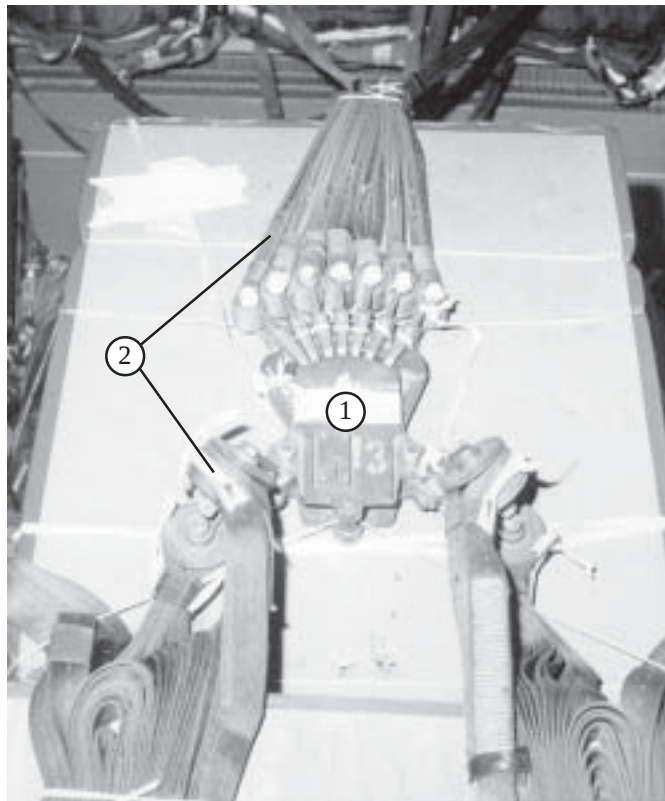


Figure 3-88. Extraction System Installed

INSTALLING THE PARACHUTE RELEASE SYSTEM

3-88. Install the cargo parachute release as shown in Figure 3-89.



- ① Position the M-2 release on the release platform.
- ② Attach the suspension slings and the riser extensions to the M-2 release and secure release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
- ③ S-fold and tie any slack in the suspension slings with one turn type I, 1/4-inch cotton webbing (not shown).

Figure 3-89. Parachute Release Installed

PLACING EXTRACTION PARACHUTE

3-89. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

3-90. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

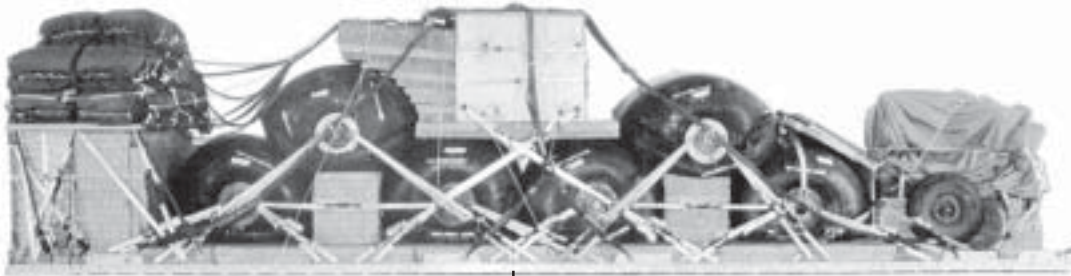
3-91. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 3-90. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

3-92. Use the equipment list in Table 3-4 to rig the load shown in Figure 3-90.

CAUTION

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.



CB

RIGGED LOAD DATA

Weight	32,730 pounds
Maximum Weight	35,000 pounds
Height	97 inches
Width	108 inches
Overall Length	411 inches
Overhang: Front (Tongue of pump)	9 inches
Rear (EFTC)	18 inches
Center of Balance (CB) (from the front edge of the platform)	201 inches

Figure 3-90. Six 500-Gallon Drums With Pump and Separator Rigged for Low-Velocity Airdrop

Table 3-4. Equipment Required for Rigging Six 500-Gallon Drums with Pump and Separator

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	13
4030-00-678-8562	Clevis, medium	4
8305-00-880-8155	Cloth coated, green, 60-inch	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-01-326-7309	Coupling, airdrop, extraction force transfer w/28-ft	1
1670-00-360-0328	Cover, clevis, large	7
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-00-003-4391	Knife, parachute bag (for DES)	2
1670-01-183-2678	Leaf, extraction line (line bag)(add 1 for DES)	2
1670-01-064-4452	Line, drogue (for DES) 60-foot (1-loop), type XXVI	1
1670-01-062-6304	Line, deployment: 9-foot (2-loop), type XXVI	1
1670-01-064-4454	Line, extraction: For C-130: 60-foot (6-loop), type XXVI	1
1670-01-468-9178	For C-17: 140-foot (6-loop), type XXVI	1
1670-01-062-6312	For C-141, C-5: 120-foot (6-loop), type XXVI	1
	Link assembly:	
	Two-point:	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	4
5310-00-232-5165	Nut, 1-in, hexagonal	4
1670-00-003-1954	Plate, side, 5 1/2-in	4
5365-00-007-3414	Spacer, large	4
	Two-point: (for DES)	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2

Table 3-4. Equipment Required for Rigging Six 500-Gallon Drums with Pump and Separator (Continued)

National Stock Number	Item	Quantity
1670-01-307-1055	Three-point	2
1670-00-006-2752	Four-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1
5510-00-220-6146	Lumber: 2- by 4-in	As required
5510-00-220-6148	2- by 6-in	As required
5315-00-010-4659	Nail, steel wire, common, 8d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	45 sheets
1670-01-016-7841	Parachute: Cargo, G-11C	7
1670-00-040-8135	Cargo, extraction, 28ft	2
1670-01-063-3715	Drogue, 15ft (for C-17)	1
1670-01-353-8425	Platform, airdrop, type V, 32-foot: Bracket assembly, component, (EFTC)	(1)
1670-01-247-2389	Bracket, suspension	(8)
1670-01-162-2372	Clevis assembly, type V	(88)
1670-01-353-8424	Extraction bracket assembly	(1)
1670-01-162-2381	Link, tandem, suspension link assembly	(2)
5530-00-618-8073	Plywood, 3/4- by 48- by 96-in	4 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
1670-01-062-6306	Sling, cargo airdrop For suspension: 3-ft (4-loop), type XXVI nylon webbing	8
1670-01-062-6305	9-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6308	16-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6311	For riser extension: 120-ft (2-loop), type XXVI nylon webbing	7

**Table 3-4. Equipment Required for Rigging Six 500-Gallon Drums with Pump and Separator
(Continued)**

National Stock Number	Item	Quantity
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	88
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-260-6890	Type X	As required

Chapter 4

Rigging AAFARS For Low-Velocity Airdrop On Type V Platform

SECTION I- RIGGING AAFARS WITH THREE 500-GALLON FUEL DRUMS

DESCRIPTION OF LOAD

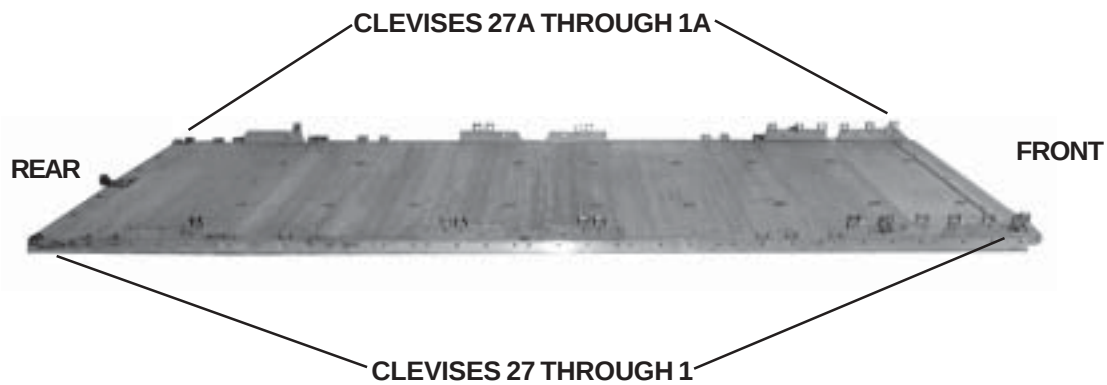
4-1. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 20-foot type V platform with four G-11 cargo parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum of 55 GPM. There are three collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The total rigged overall length is 258 inches. Width is 108 inches. Height is 88 inches. Center of balance is 121 inches.

- Note:**
1. For drums filled with liquid other than gasoline, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

4-2. Prepare a 20-foot type V airdrop platform using two tandem links, eight suspension brackets and 54 tie-down clevises as shown in Figure 4-1.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.



Steps:

1. Inspect, or assemble and inspect, the platform as outlined in TM 10-1670-268-20&P/TO 13C7-52-22.
2. Install a tandem link on the front of each platform side rail using holes 1, 2, and 3.
3. Install a suspension bracket to each platform side rail using holes 5, 6, and 7.
4. Install a suspension bracket to each platform side rail using holes 17, 18, and 19.
5. Install a suspension bracket to each platform side rail using holes 22, 23, and 24.
6. Install a suspension bracket to each platform side rail using holes 34, 35, and 36.
7. Install a tie-down clevis to bushings 1 (doubled), 3, and 4 on each front tandem link.
8. Install a tie-down clevis to bushings 1, 3 (doubled), and 4 on each of the first suspension brackets.
9. Install a tie-down clevis to bushings 2 and 3 of each of the second suspension brackets.
10. Install a tie-down clevis to bushings 2 and 3 of each of the third suspension brackets.
11. Install a tie-down clevis to bushing 1 (doubled) of each of the fourth suspension brackets.
12. Starting at the front of each platform side rail, install a tie-down clevis to the bushings bolted to holes 8, 10, 11, 29, 30, 32, 33, 37 (doubled), 38 (doubled), and 40 (doubled).
13. Starting at the front of the platform, number the clevises bolted to the right side from 1 through 27 and those bolted to the left side from 1A through 27A.

Figure 4-1. Platform Prepared

PREPARING HONEYCOMB

4-3. Build honeycomb stacks as shown in Figure 4-2.

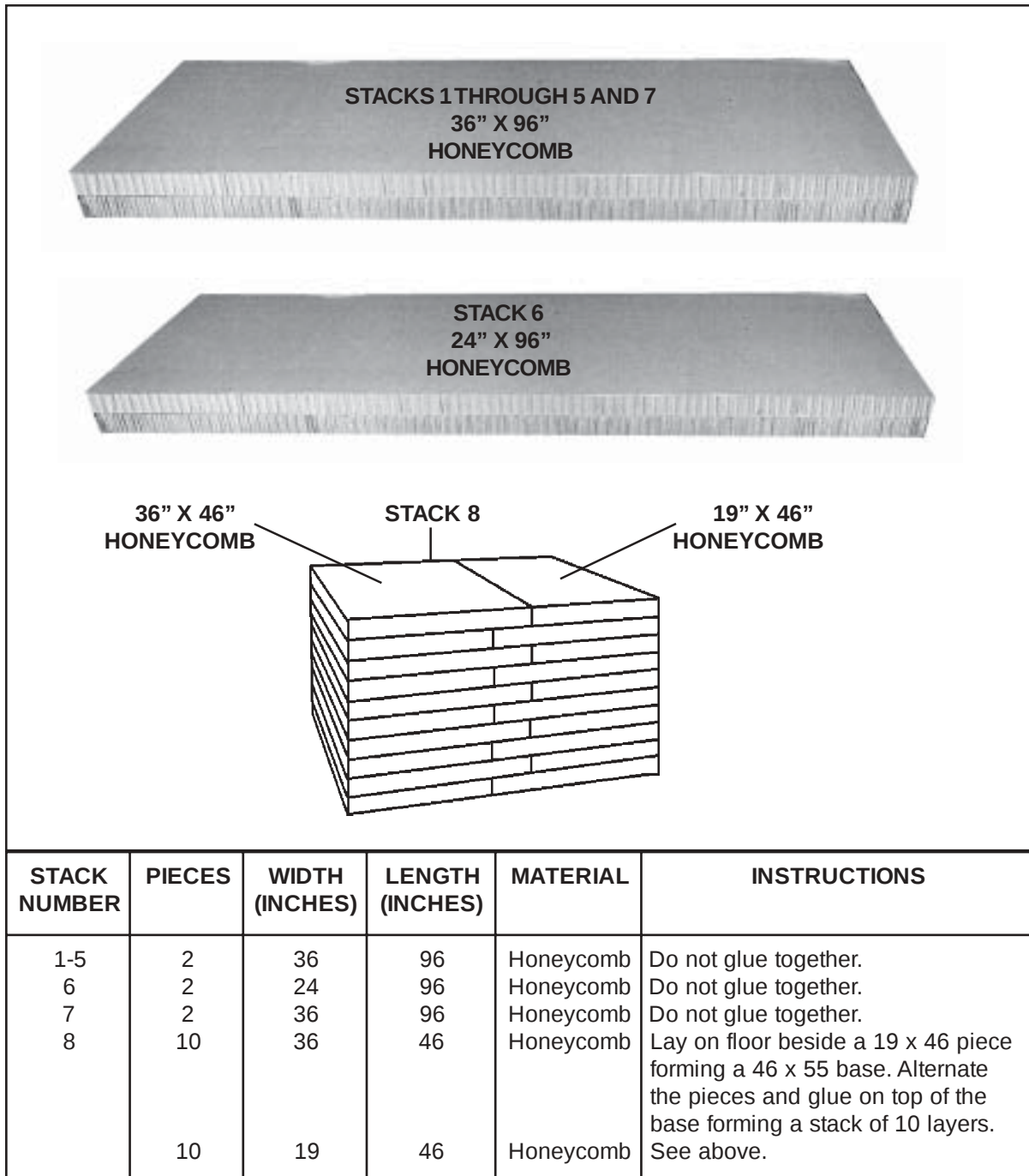


Figure 4-2. Honeycomb Stacks Prepared

POSITIONING HONEYCOMB STACKS

4-4. Position honeycomb stacks as shown in Figure 4-3.

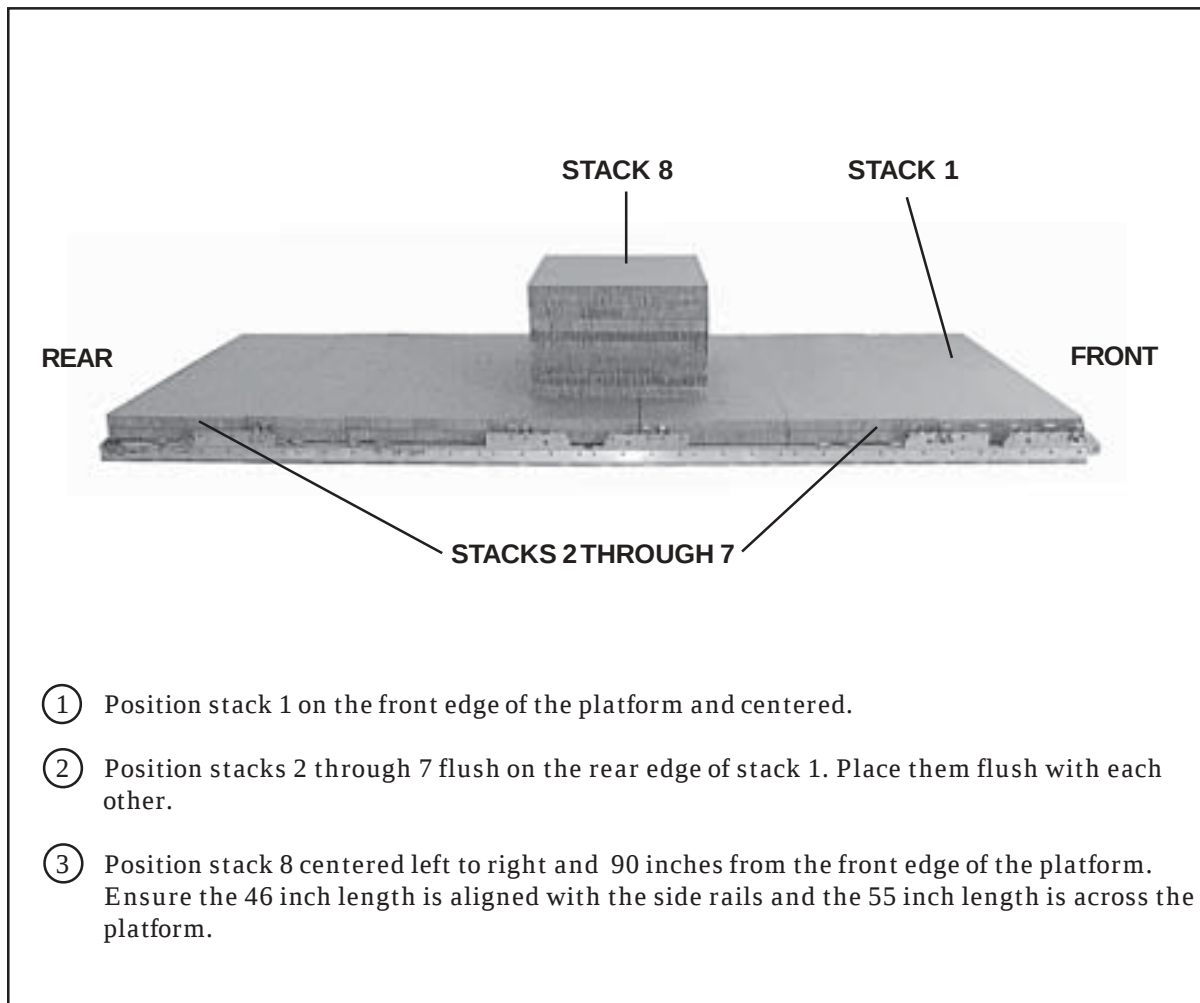


Figure 4-3. Honeycomb Stacks Positioned

BUILDING THE EQUIPMENT BOXES

4-5. Build the front and rear equipment boxes as shown in Figures 4-4 and 4-5.

a. Build the front equipment box using 16d nails and as shown in Figure 4-4.

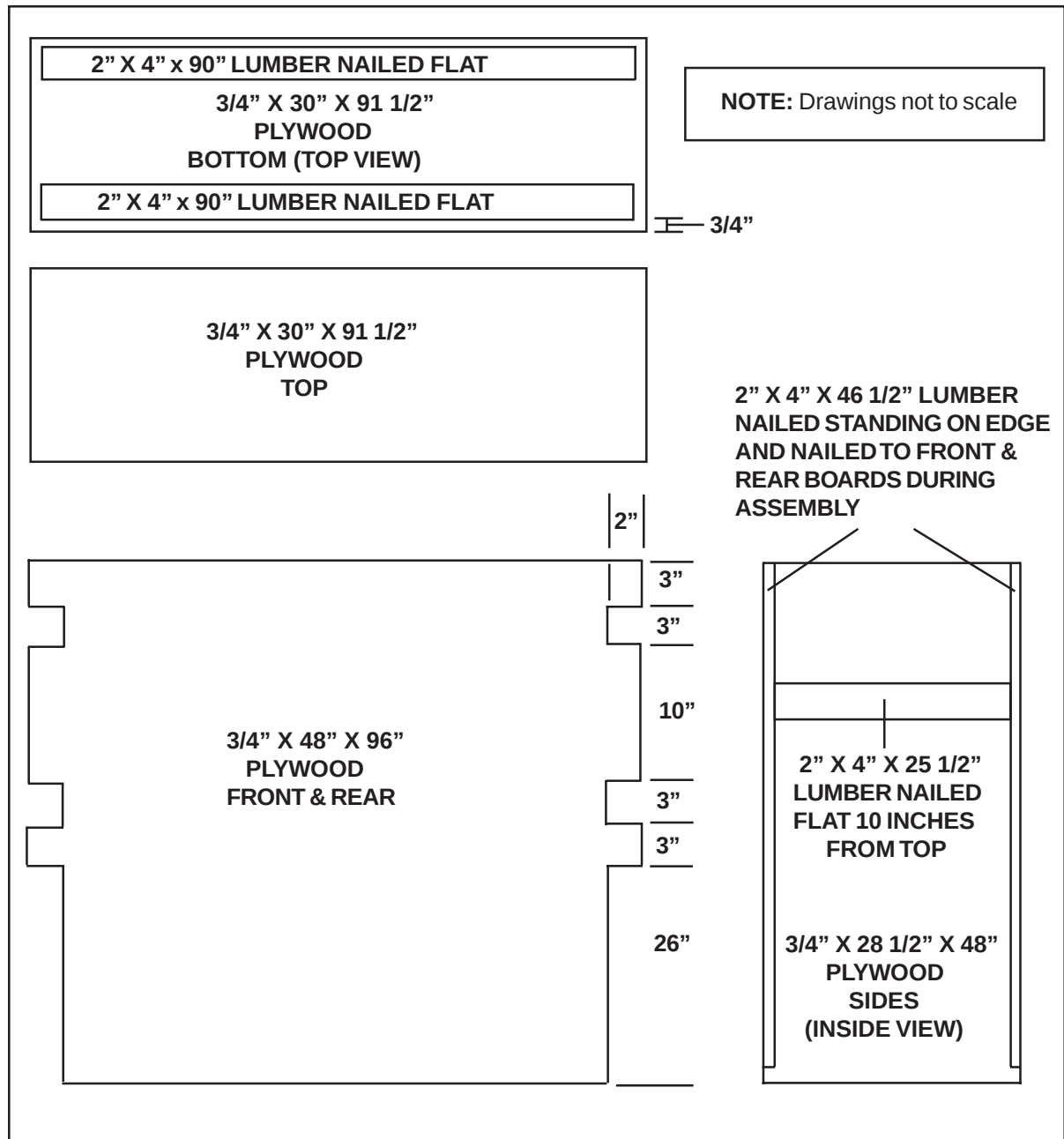


Figure 4-4. Front Equipment Box Built

- b.** Build the rear equipment box using 16d nails and as shown in Figure 4-5.

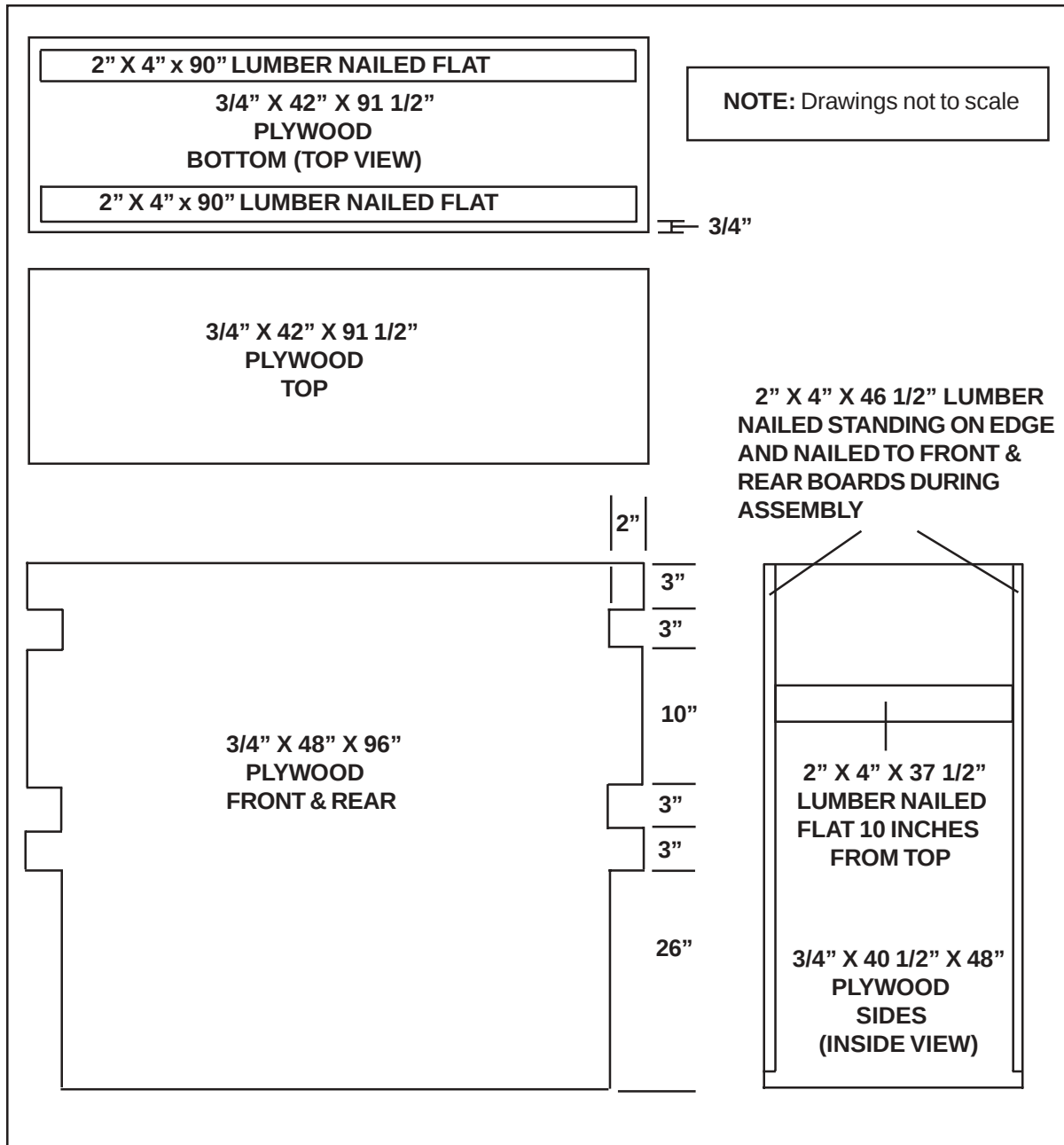


Figure 4-5. Rear Equipment Box Built

PREPARING EQUIPMENT FOR EQUIPMENT BOXES

4-6. Prepare the equipment for the equipment boxes as shown in Figures 4-6 through 4-12.

a. Prepare and secure five fire extinguishers as shown in Figure 4-6.

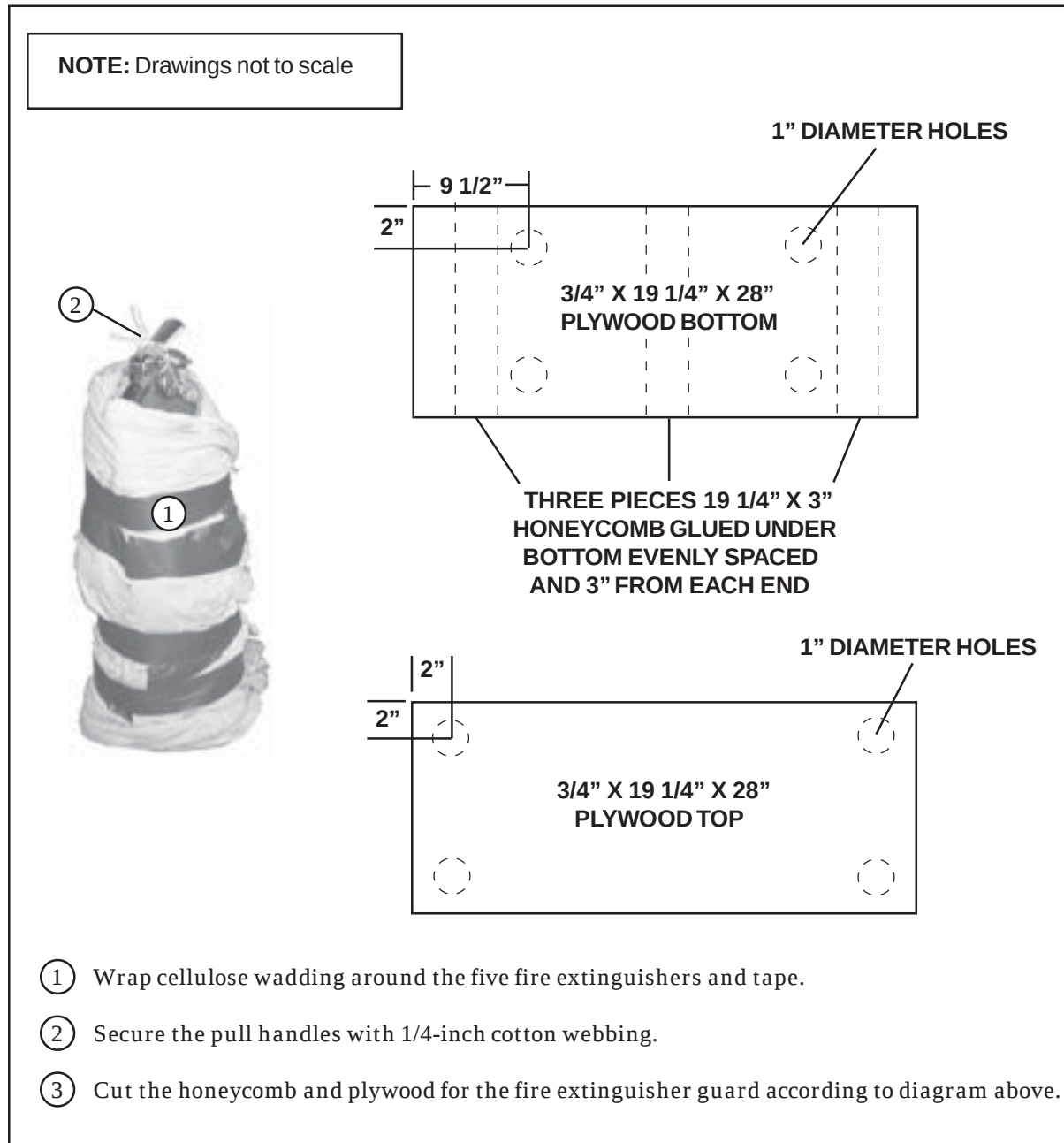
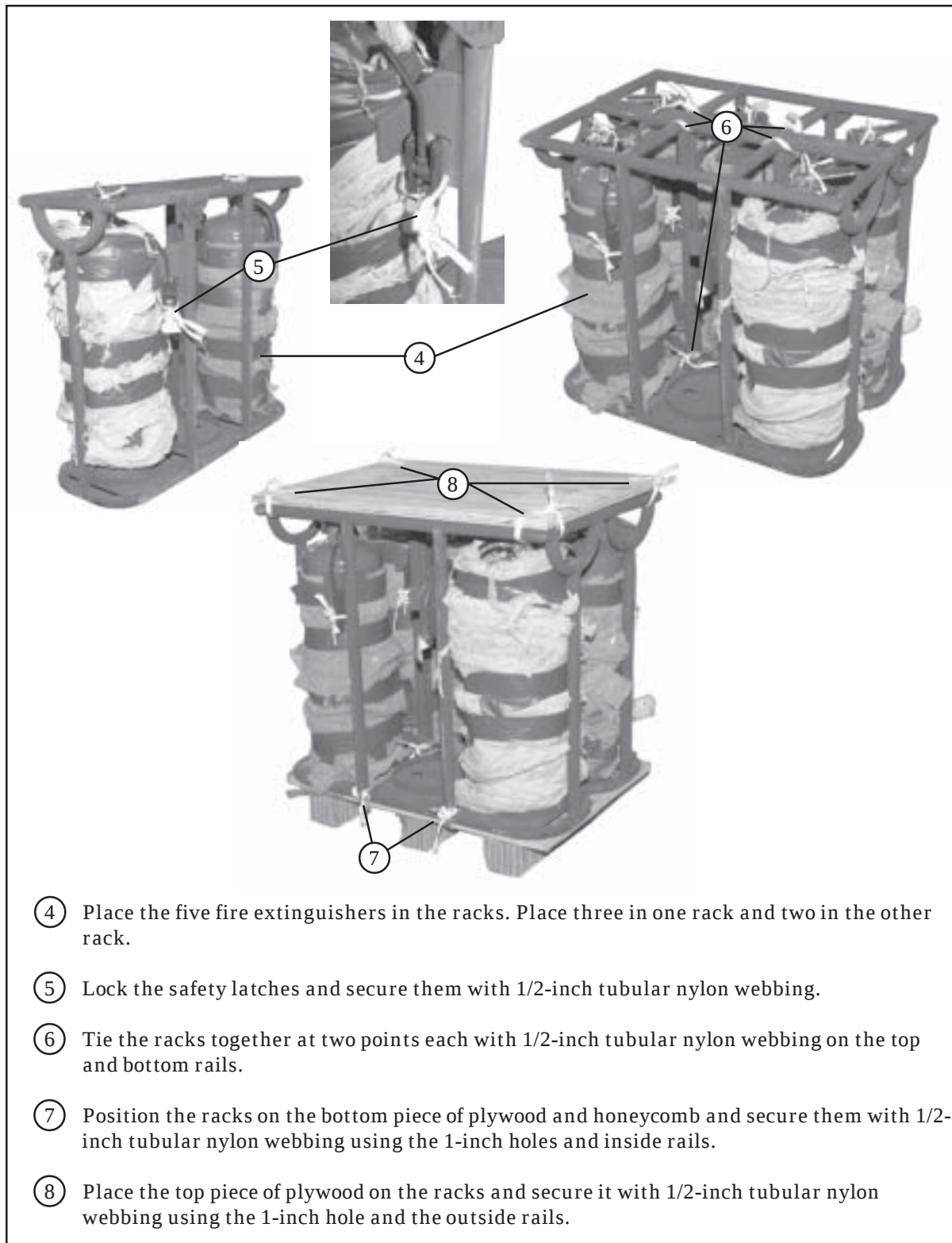


Figure 4-6. Fire Extinguishers Prepared

**Figure 4-6. Fire Extinguishers Prepared (Continued)**

b. Prepare and secure the filter separator as shown in Figure 4-7.

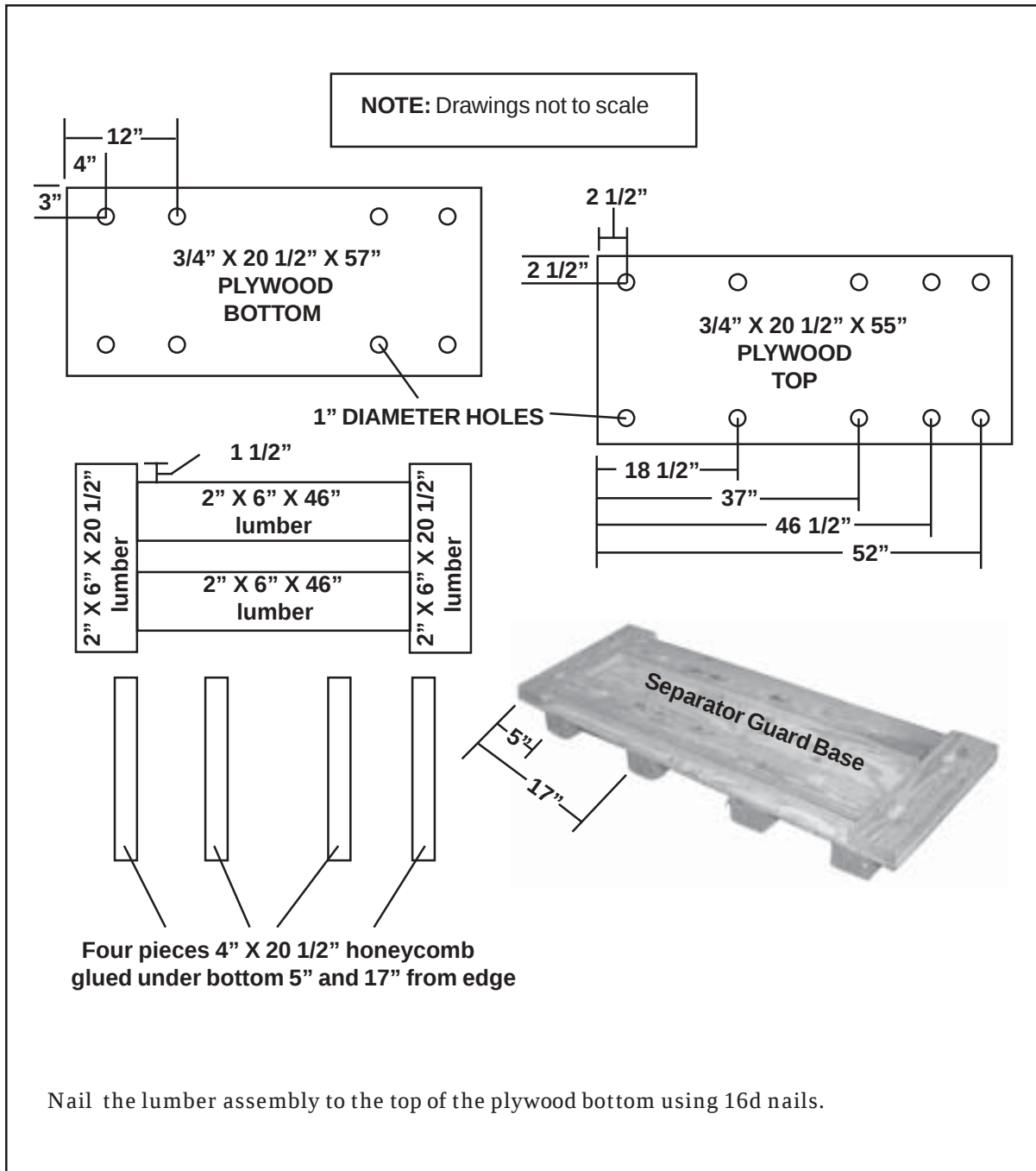


Figure 4-7. Filter Separator Secured

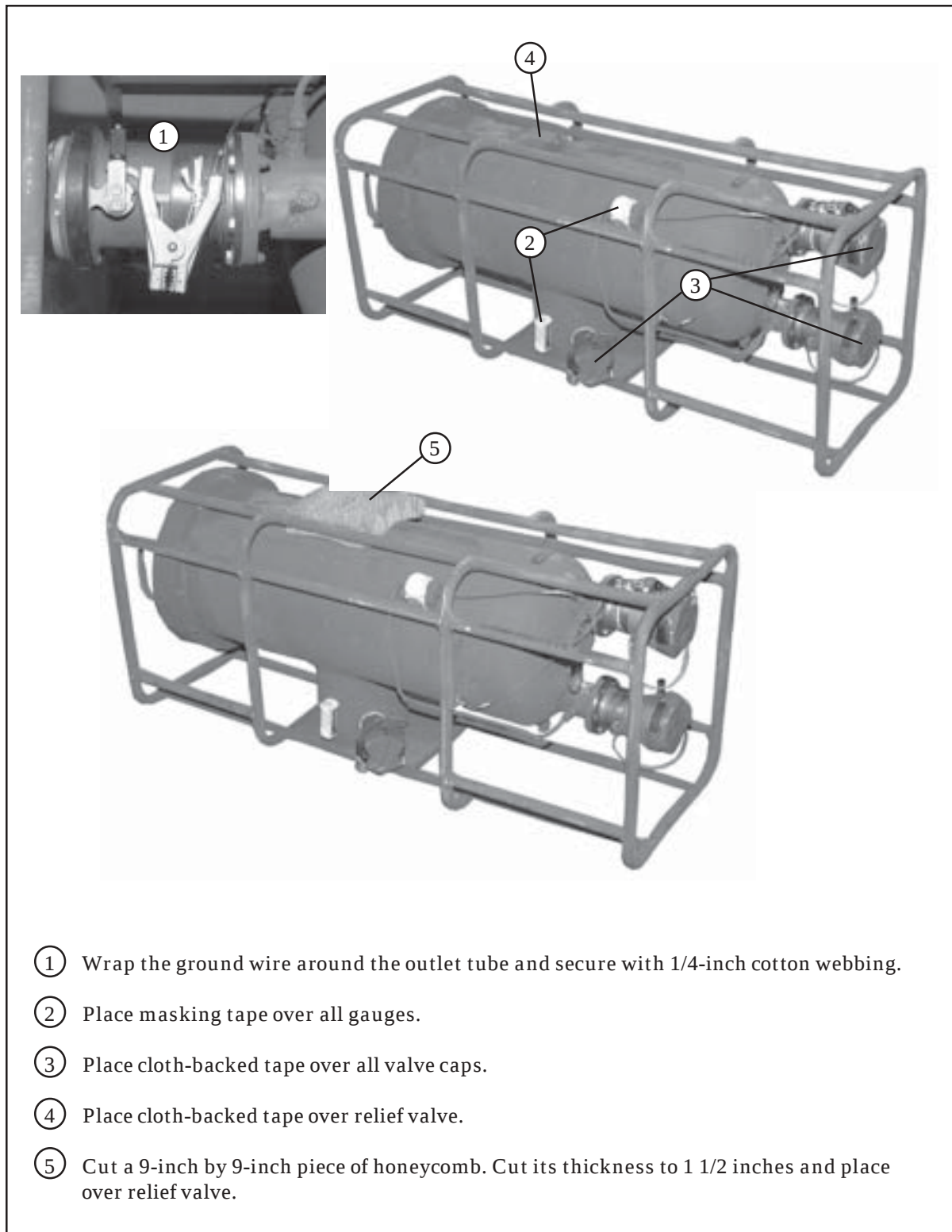


Figure 4-7. Filter Separator Secured (Continued)

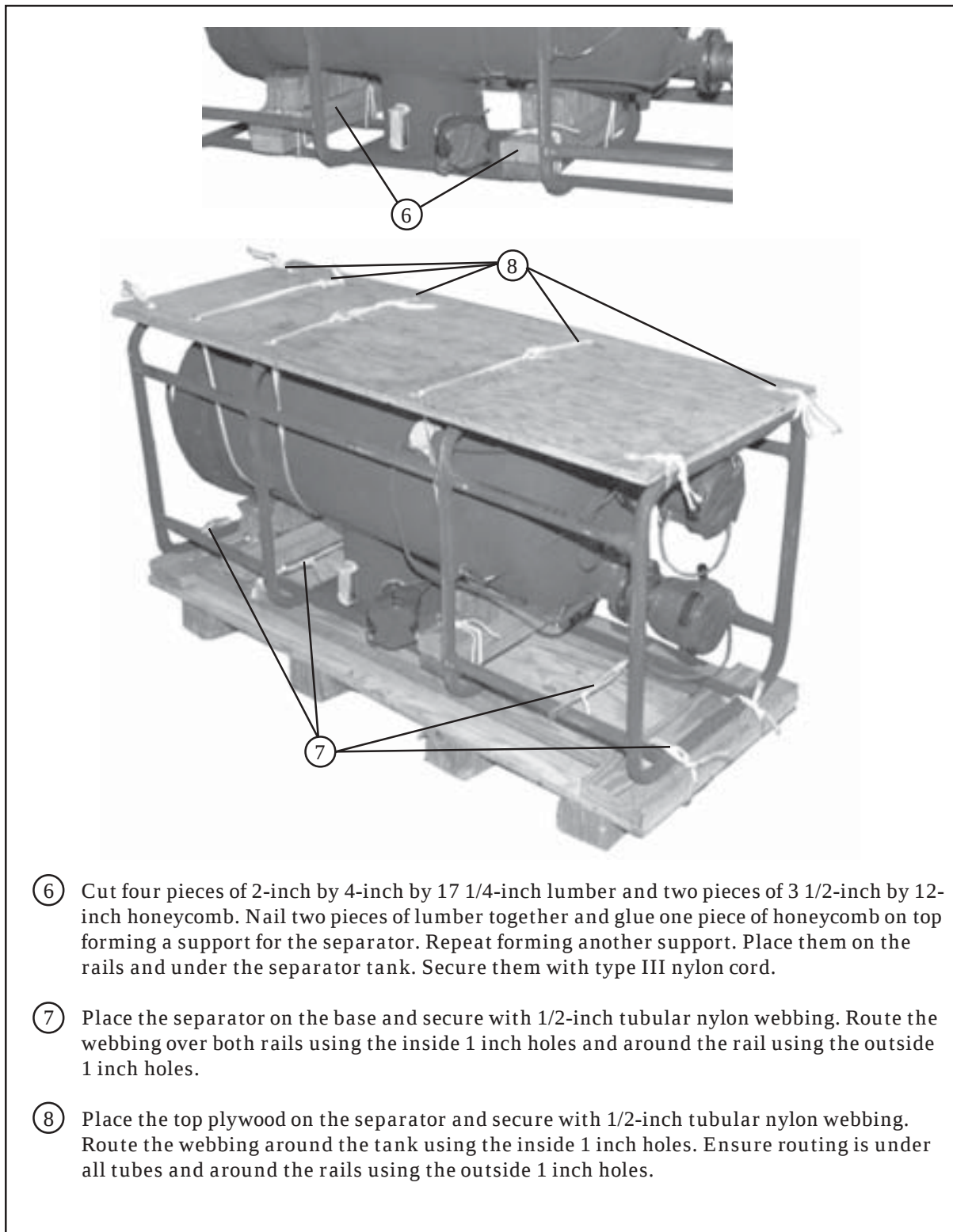


Figure 4-7. Filter Separator Secured (Continued)

c. Prepare and secure the explosion-proof motor as shown in Figure 4-8.

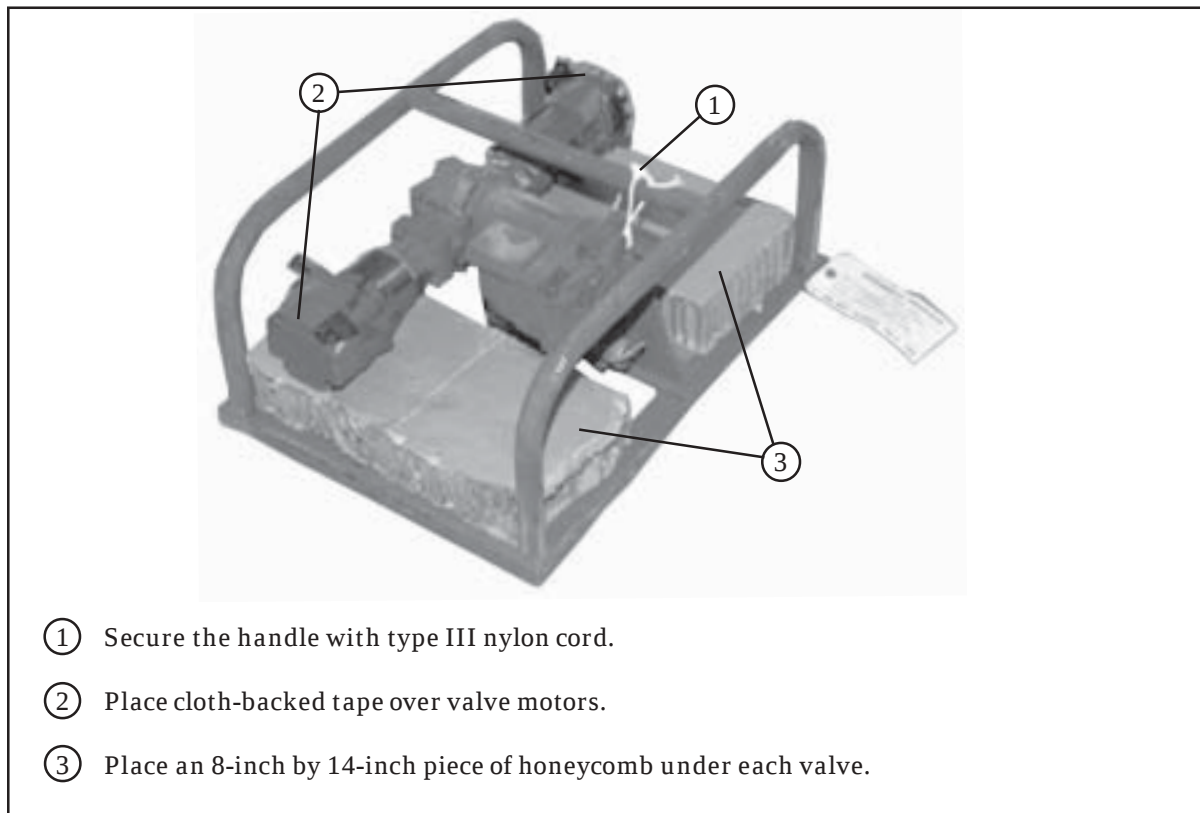


Figure 4-8. Explosion-Proof Motor Secured

d. Prepare and secure the hose and equipment bags as shown in Figure 4-9.

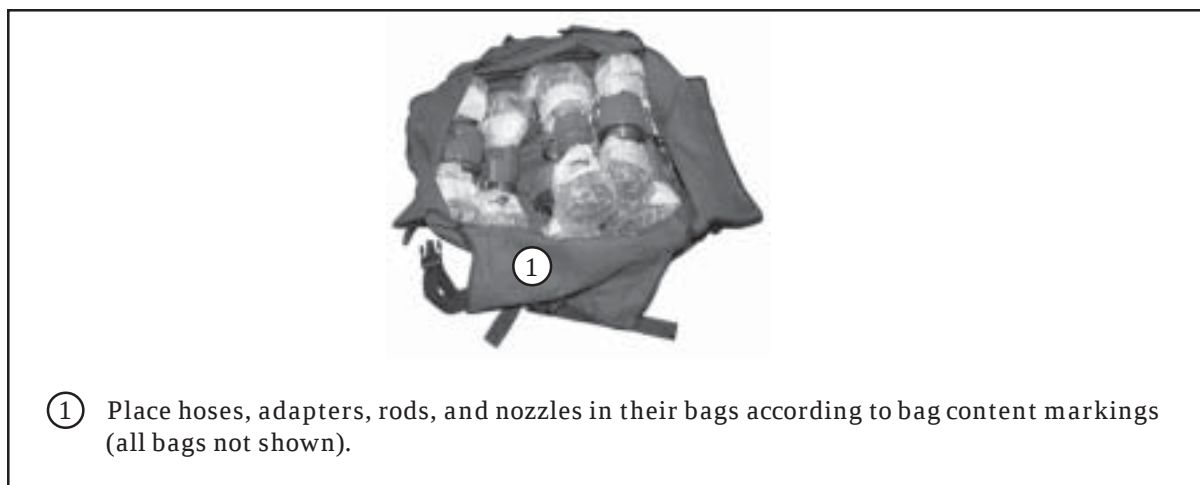


Figure 4-9. Equipment Bags Secured

e. Prepare and secure the pump as shown in Figure 4-10.

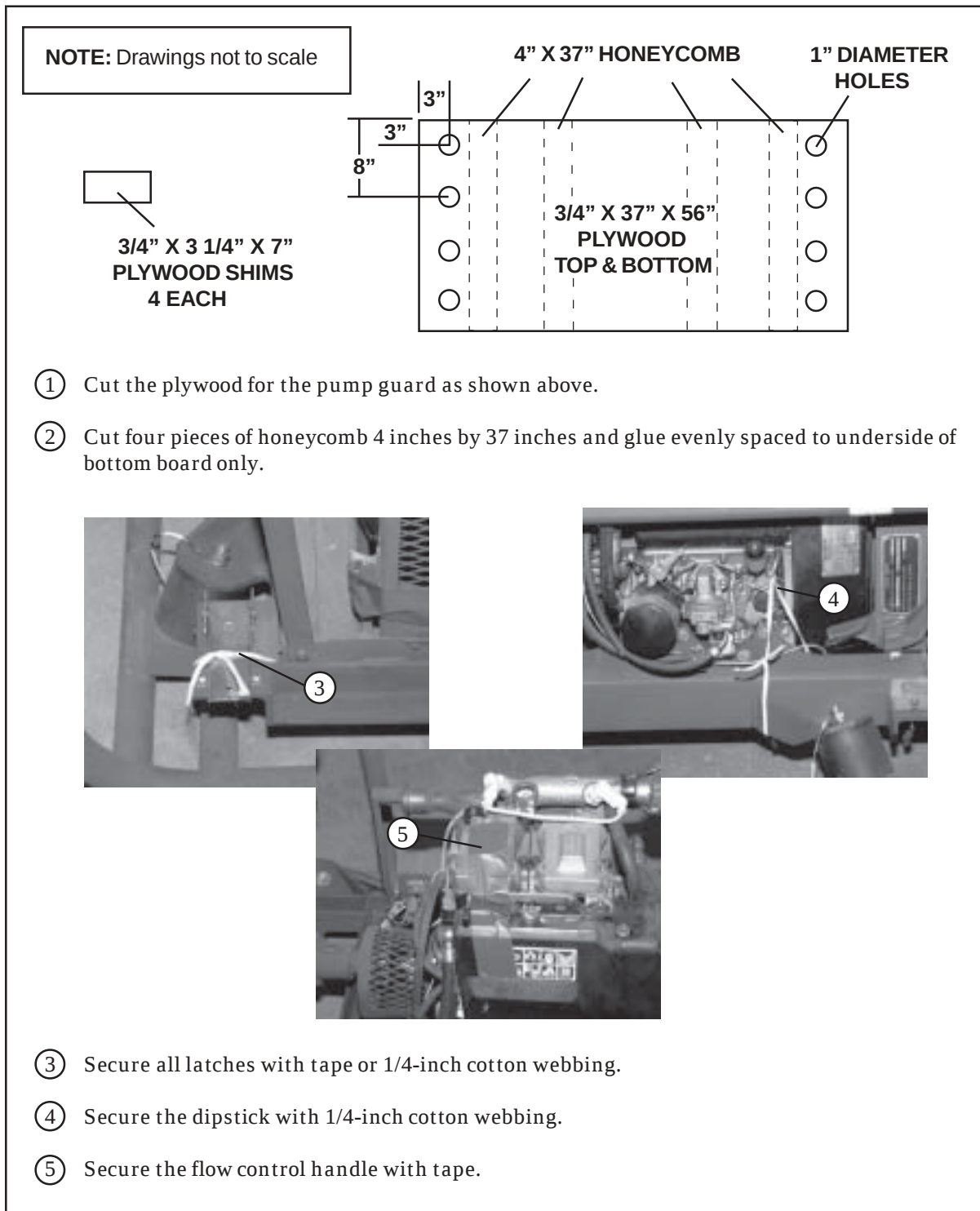


Figure 4-10. Pump Secured

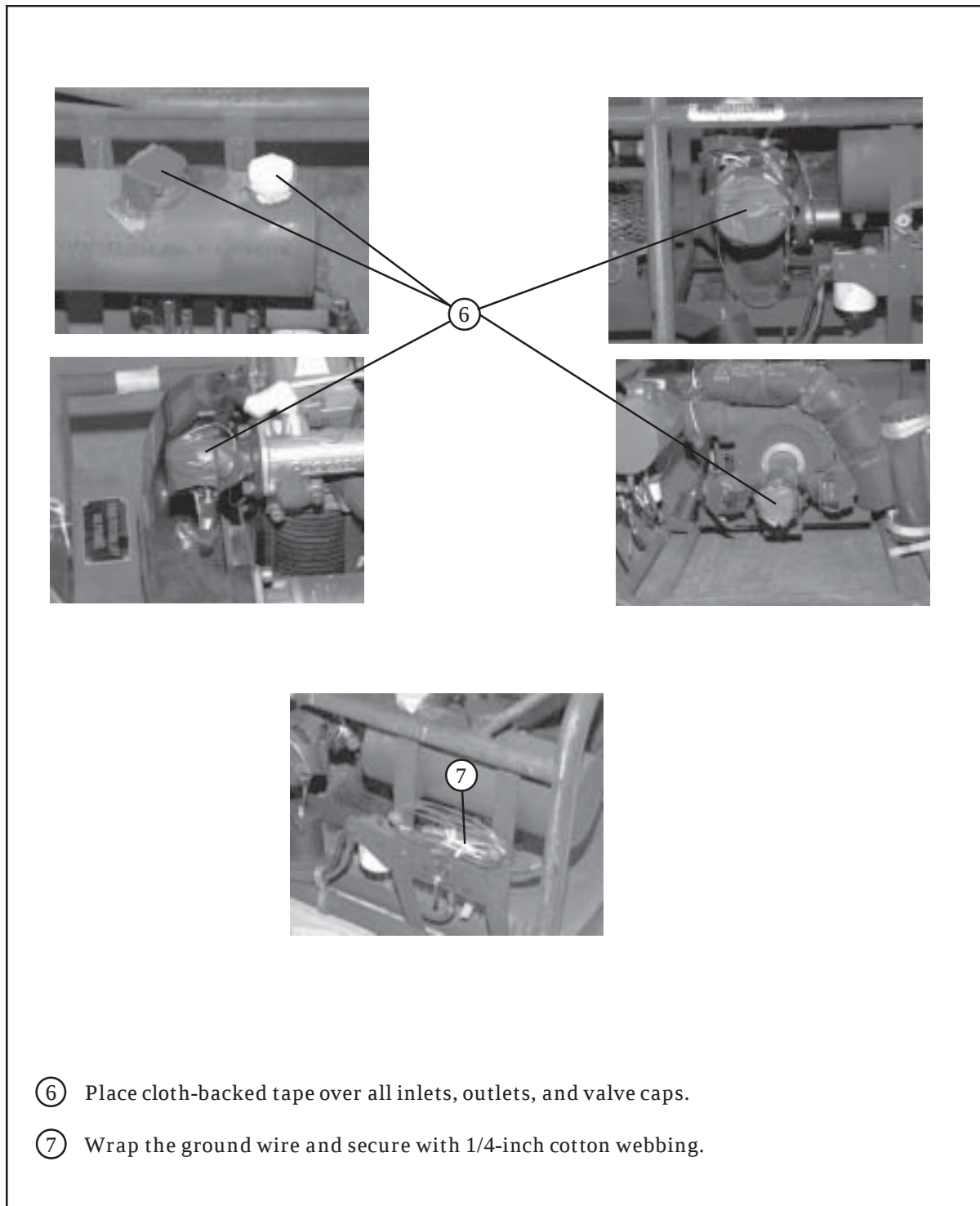


Figure 4-10. Pump Secured (Continued)

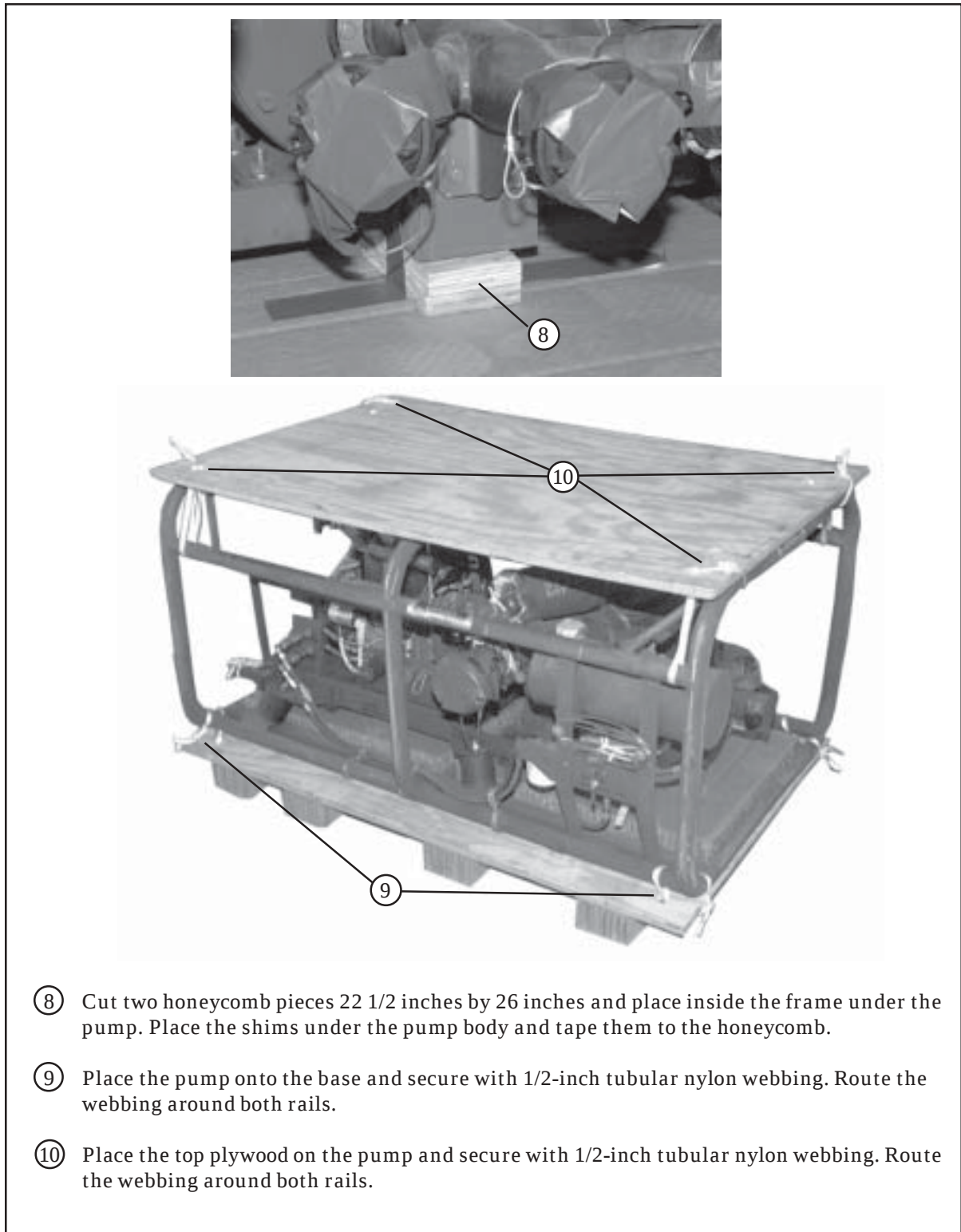


Figure 4-10. Pump Secured (Continued)

f. Prepare and secure the battery box as shown in Figure 4-11.

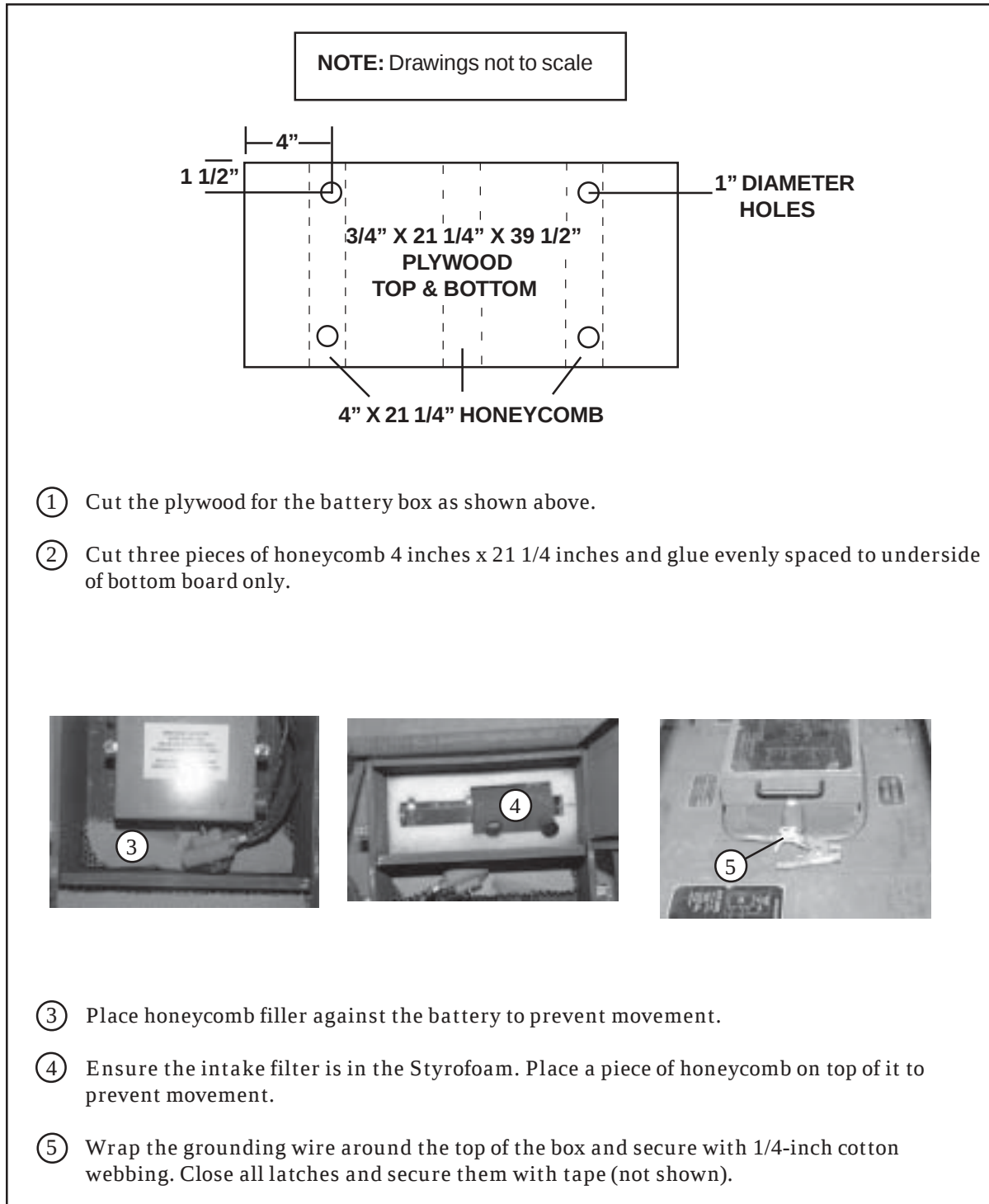
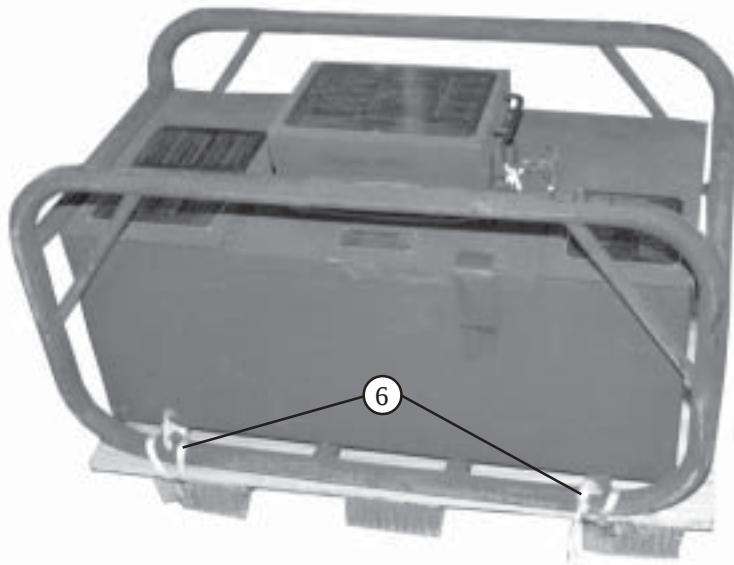
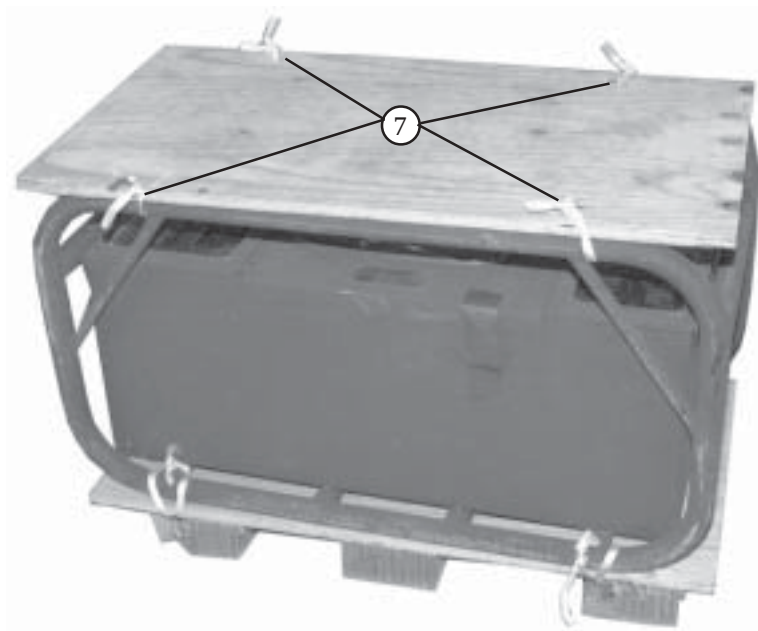


Figure 4-11. Battery Box Secured



- ⑥ Place the battery box on the base plywood and secure with 1/2-inch tubular nylon webbing around the rails.



- ⑦ Place the plywood top on the battery box and secure it with 1/2-inch tubular nylon webbing around the rails.

Figure 4-11. Battery Box Secured (Continued)

g. Prepare and secure the manuals and toolkit as shown in Figure 4-12.



- ① Secure the manuals and toolkit together using cloth-backed tape.

Figure 4-12. Manuals and Toolkit Secured

POSITIONING EQUIPMENT BOXES

4-7. Position the front and rear equipment boxes on the platform as shown in Figure 4-13.

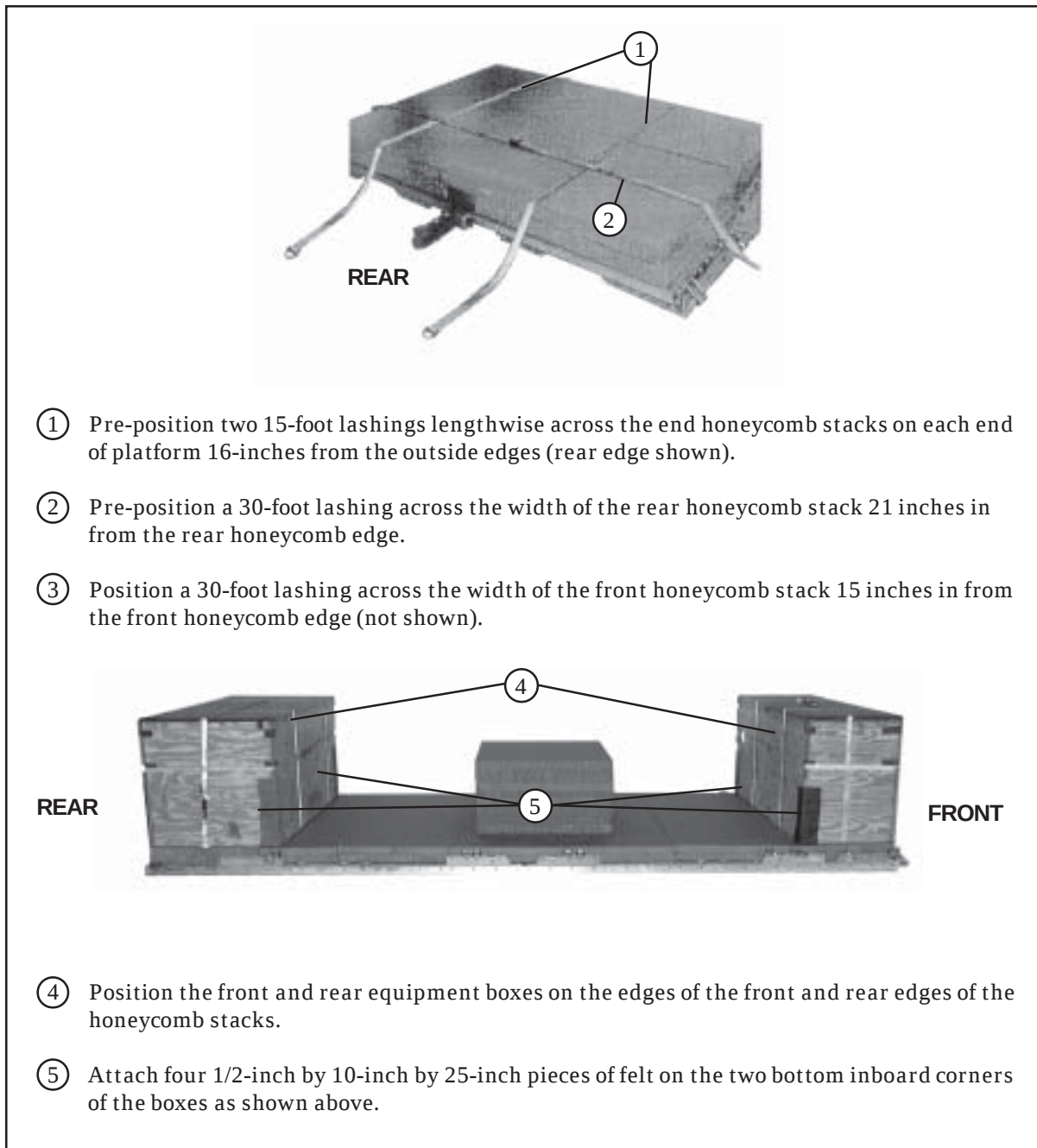


Figure 4-13. Equipment Boxes Positioned

POSITIONING AND SECURING EQUIPMENT IN EQUIPMENT BOXES

4-8. Position and secure equipment in equipment boxes as shown in Figures 4-14 and 4-15.

a. Prepare the front equipment box by placing a 22-inch by 82-inch piece of honeycomb in the floor of the box and a 23-inch by 35-inch piece of honeycomb against each end of box below the 2 x 4 lumber. Position equipment in front equipment box as shown in Figure 4-14.

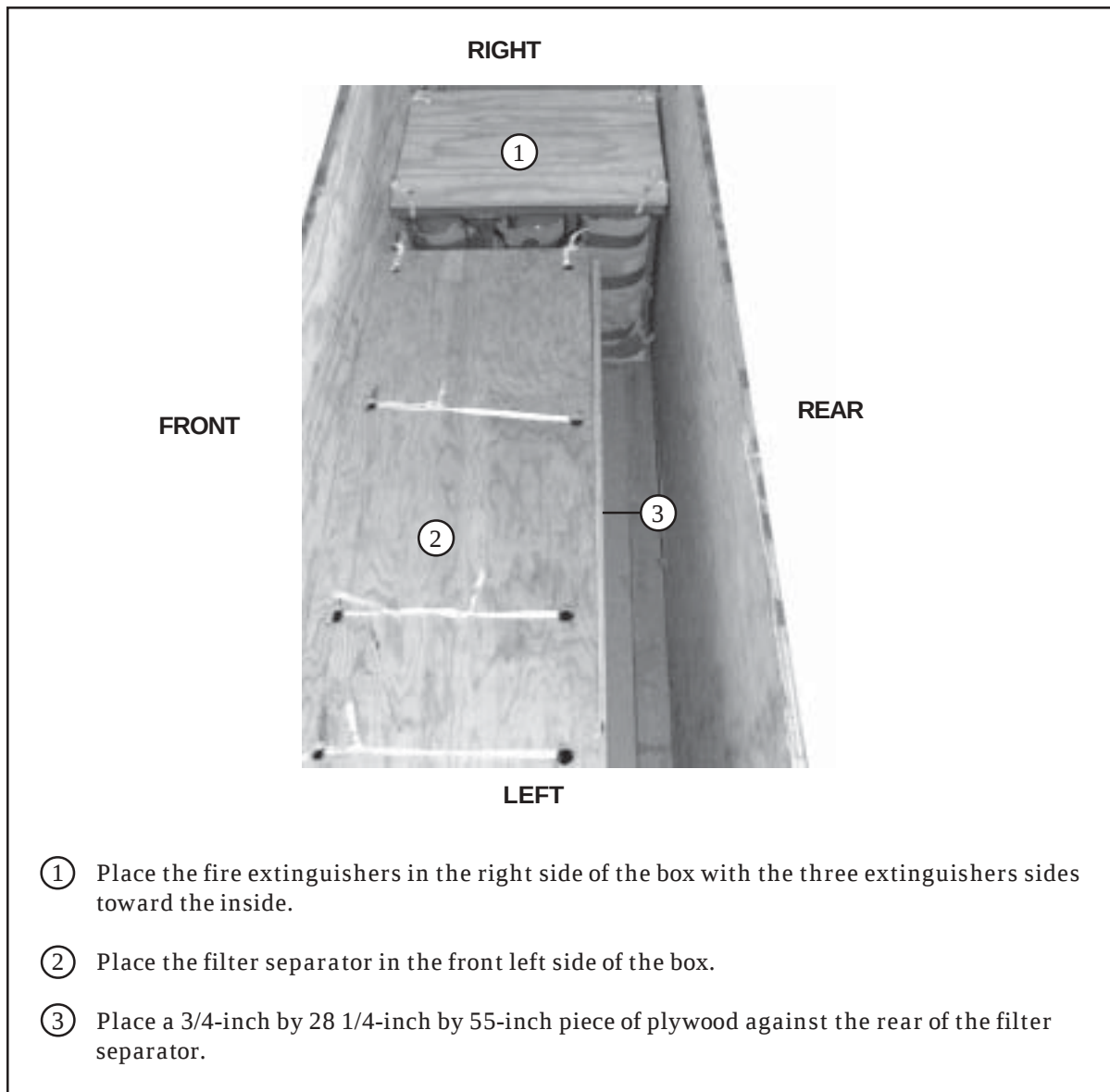


Figure 4-14. Equipment Positioned and Secured in Front Box

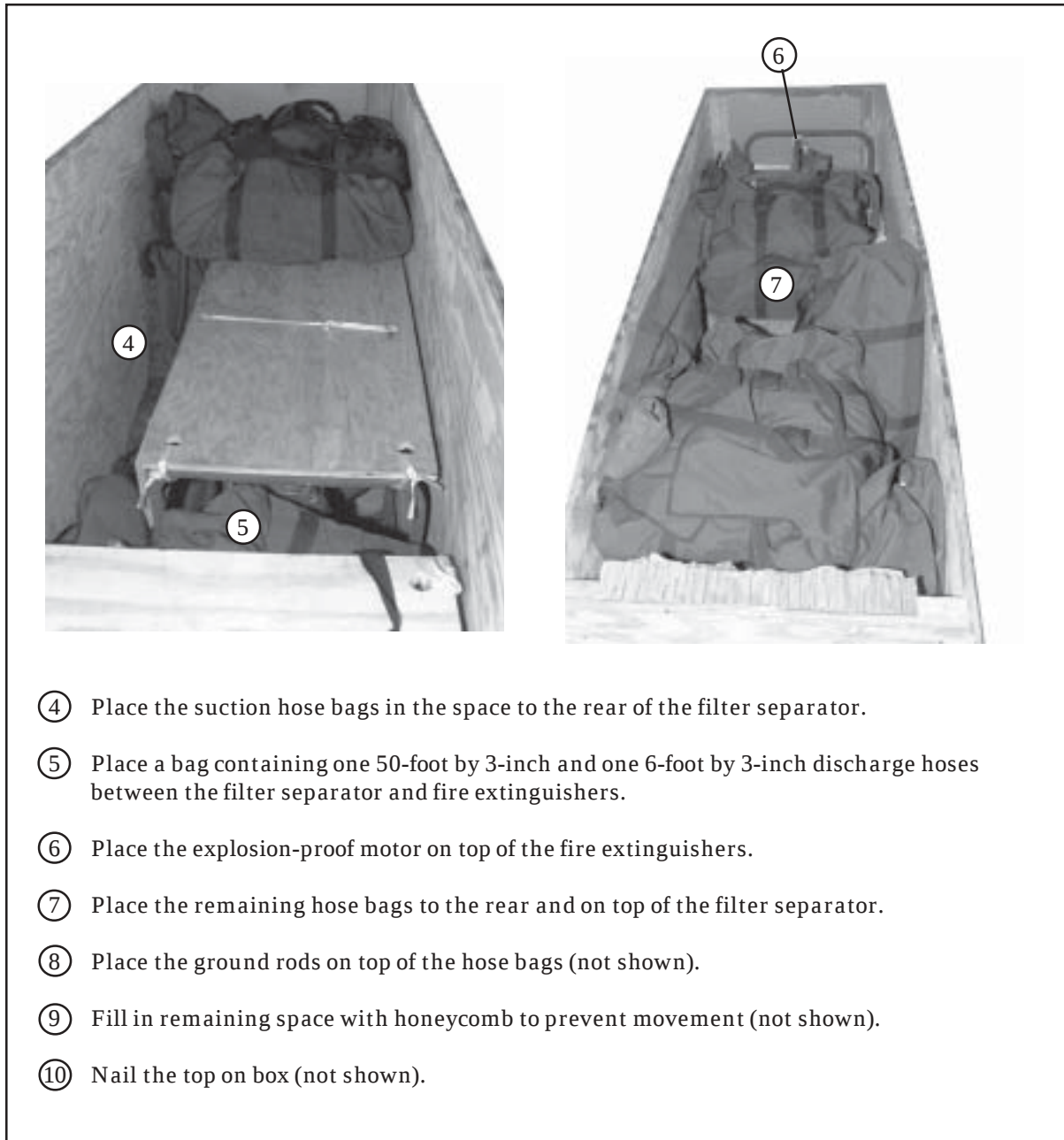


Figure 4-14. Equipment Positioned and Secured in Front Box (Continued)

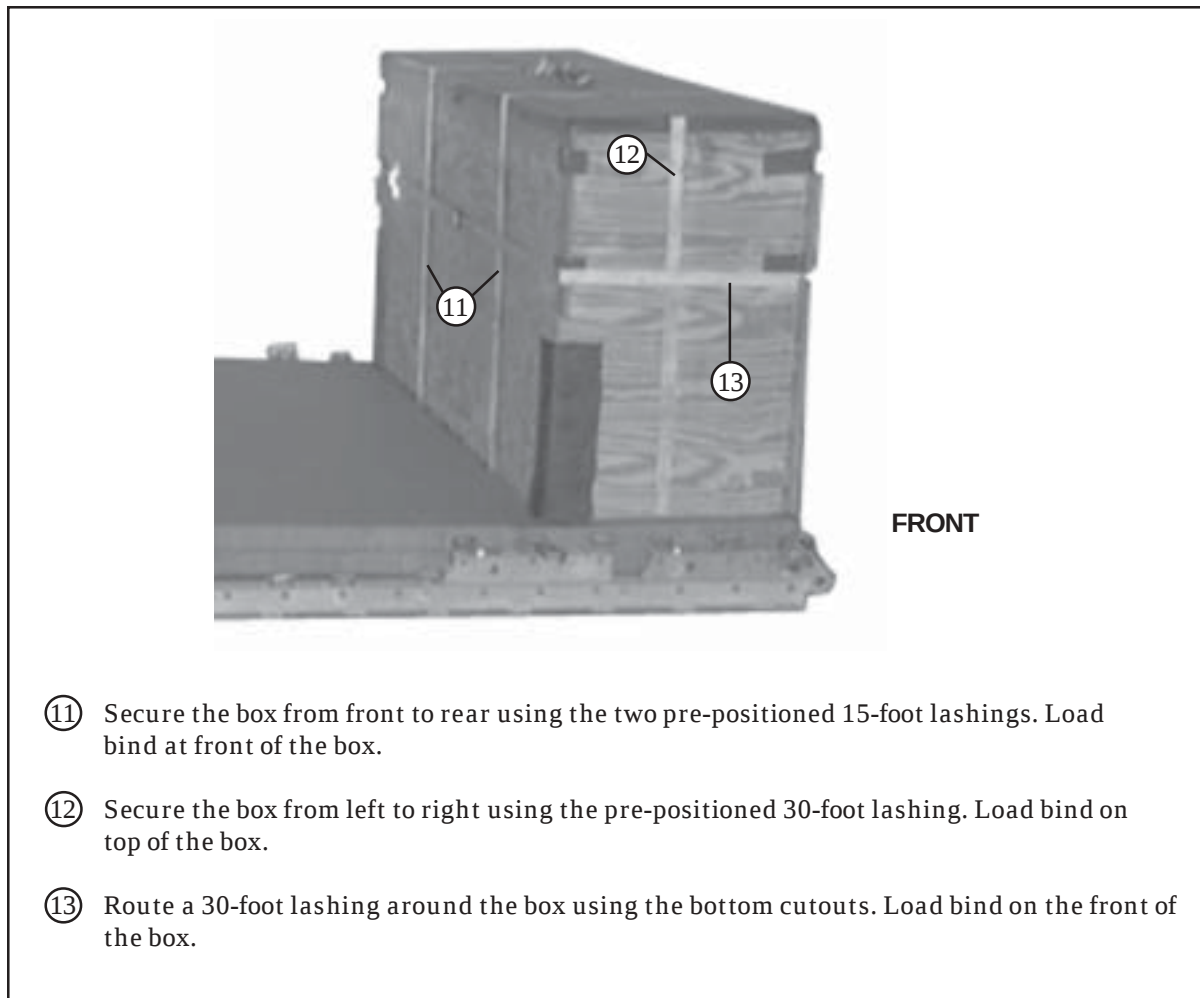


Figure 4-14. Equipment Positioned and Secured in Front Box (Continued)

b. Prepare the rear equipment box by placing a 34-inch by 82-inch piece of honeycomb in the floor of the box and a 37 1/2-inch by 35-inch piece of honeycomb against each end of box below the 2 x 4 lumber. Position equipment in front equipment box as shown in Figure 4-15.

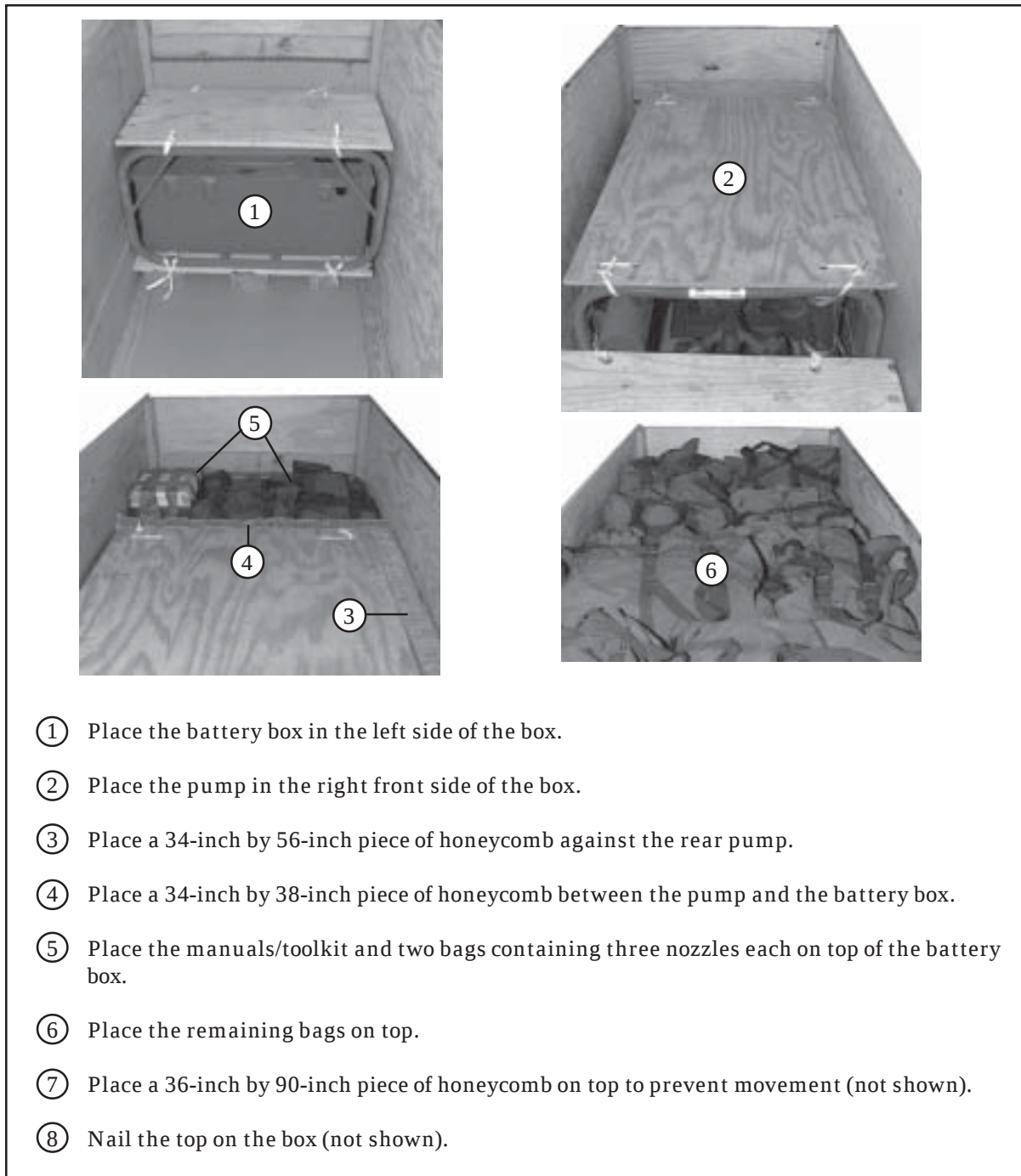


Figure 4-15. Equipment Positioned and Secured in Rear Box

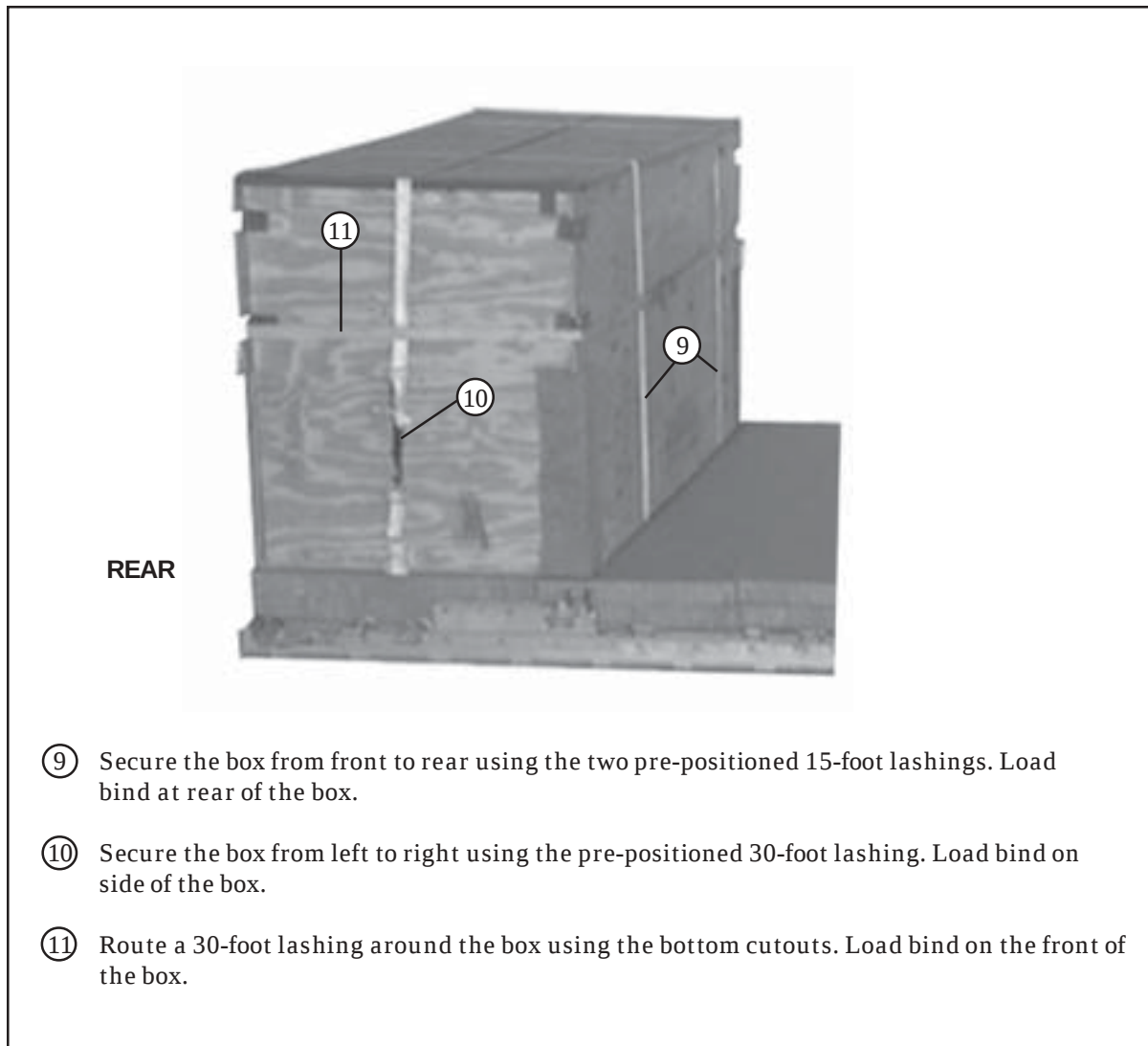


Figure 4-15. Equipment Positioned and Secured in Rear Box (Continued)

LASHING THE EQUIPMENT BOXES TO THE PLATFORM

4-9. Lash the equipment boxes as shown in Figures 4-16 through 4-21.

a. Lash the front equipment box to the platform as shown in Figures 4-16 through 4-18.

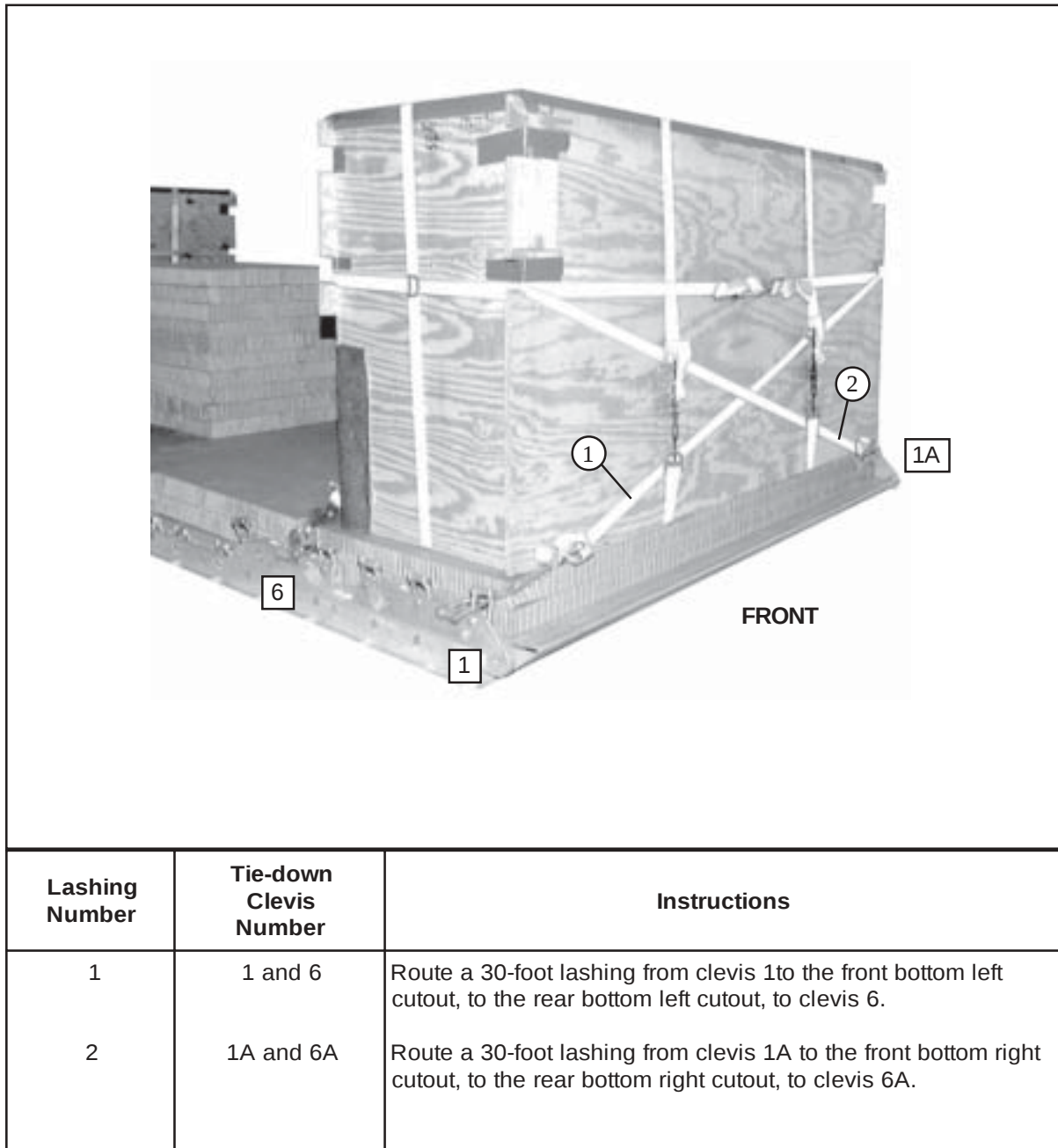
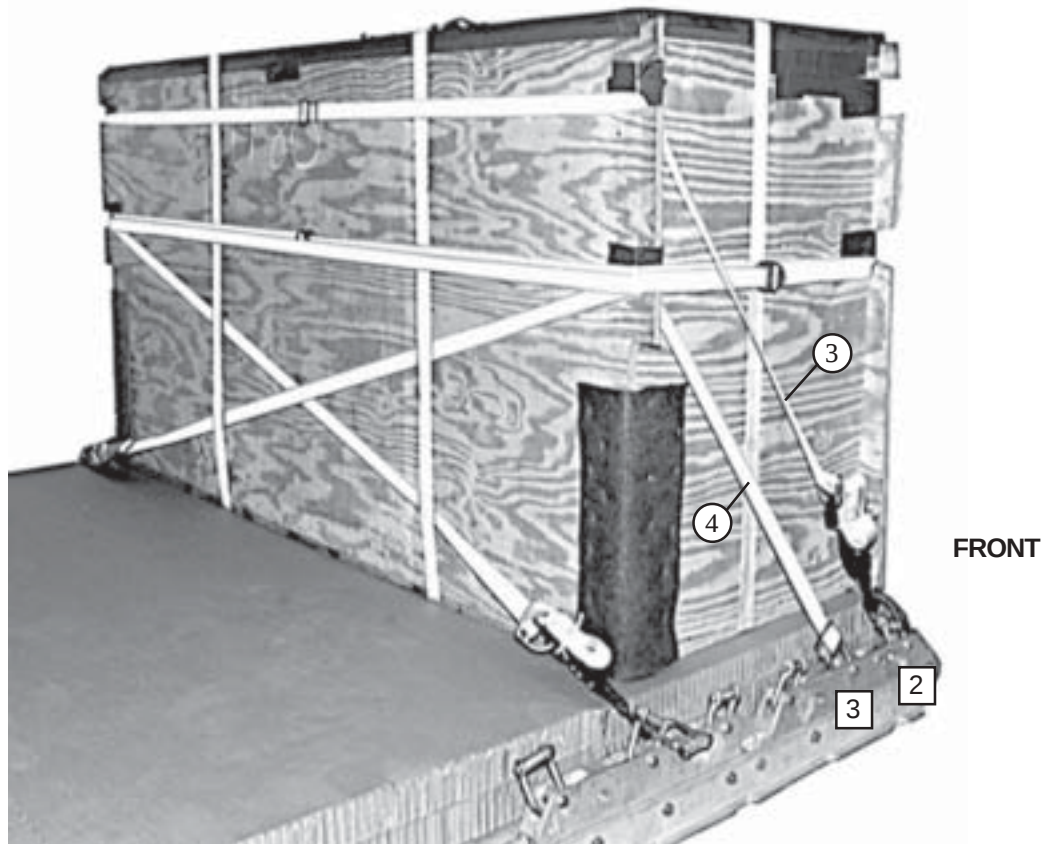


Figure 4-16. Lashings 1 and 2 Installed



Lashing Number	Tie-down Clevis Number	Instructions
3	2 and 2A	Route a 30-foot lashing through its own D-ring on clevis 2 to the rear top right cutout, to the rear top left cutout, to clevis 2A.
4	3 and 3A	Route a lashing through its own D-ring on clevis 3 to the rear bottom left cutout, to the rear bottom right cutout, to clevis 3A.

Figure 4-17. Lashings 3 and 4 Installed

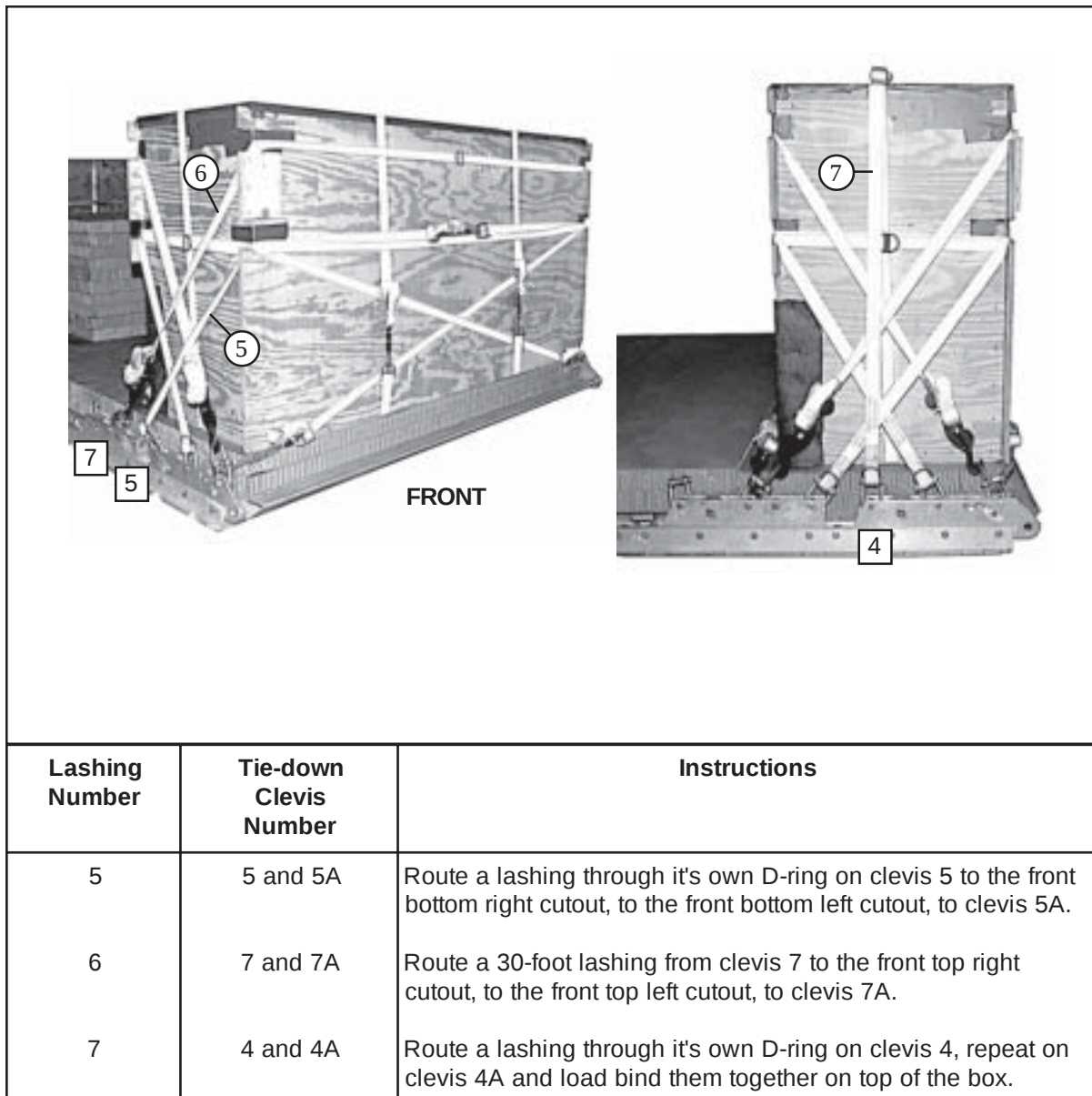


Figure 4-18. Lashings 5 through 7 Installed

b. Lash the rear equipment box to the platform as shown in Figures 4-19 through 4-21.

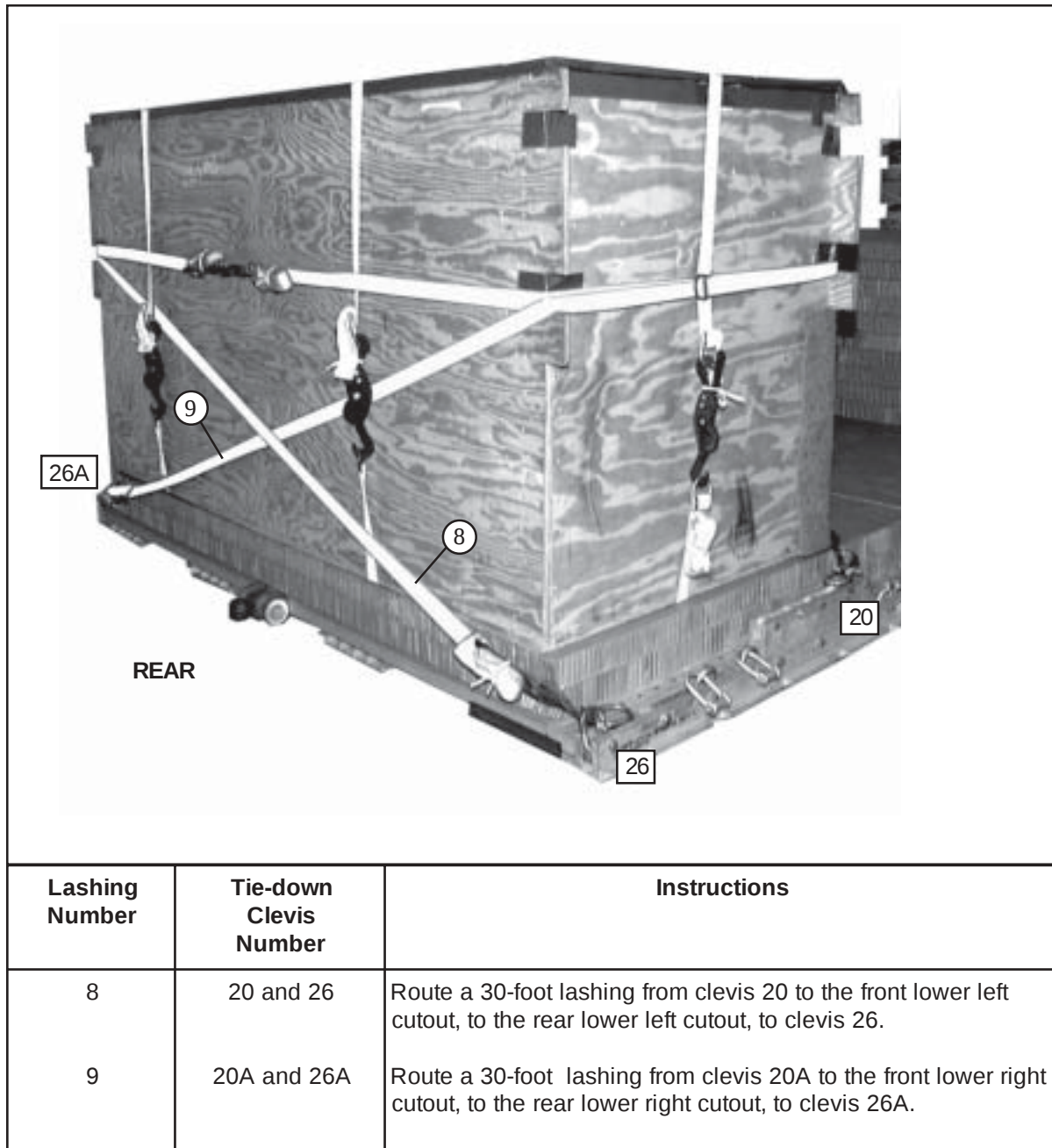


Figure 4-19. Lashings 8 and 9 Installed

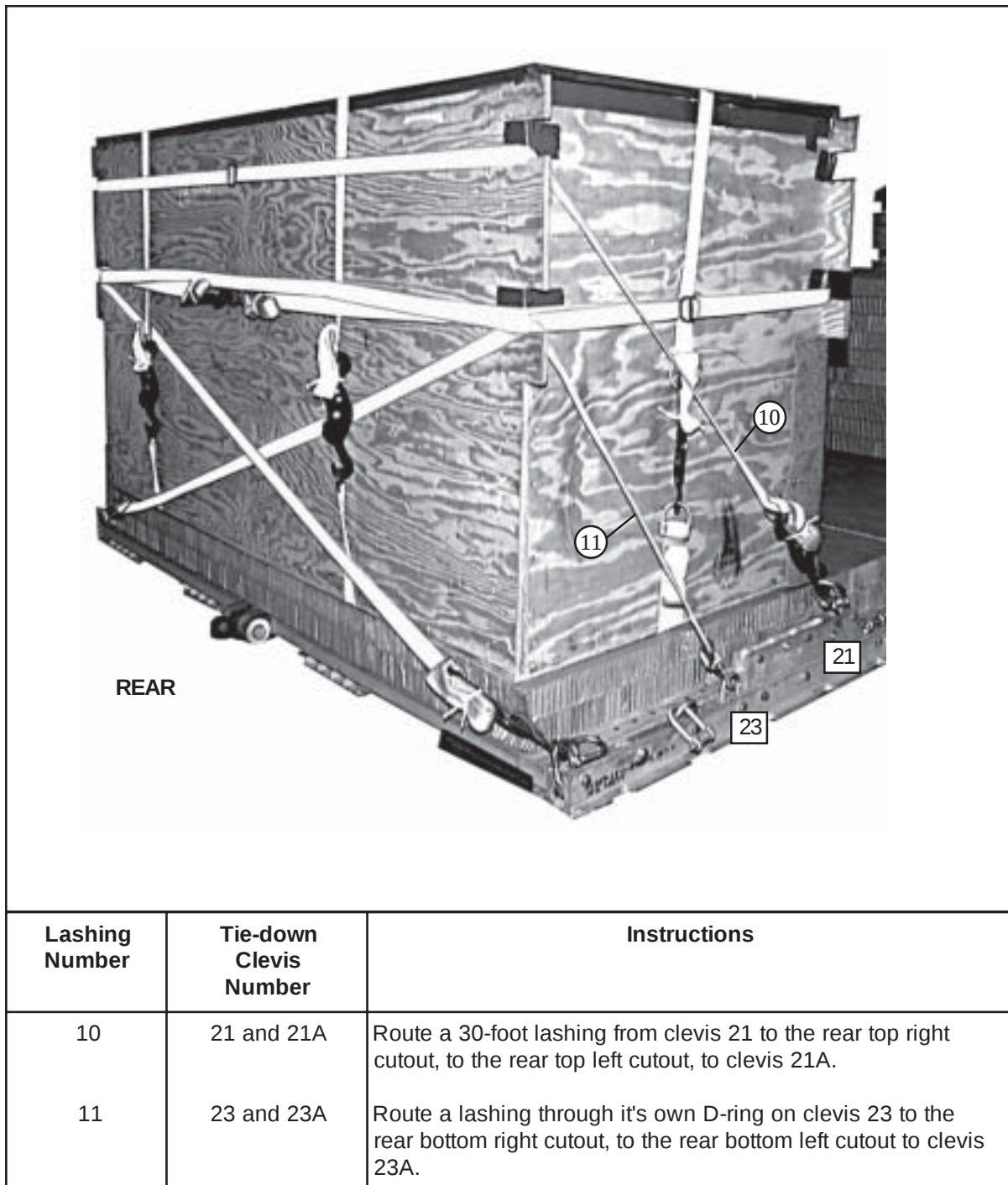
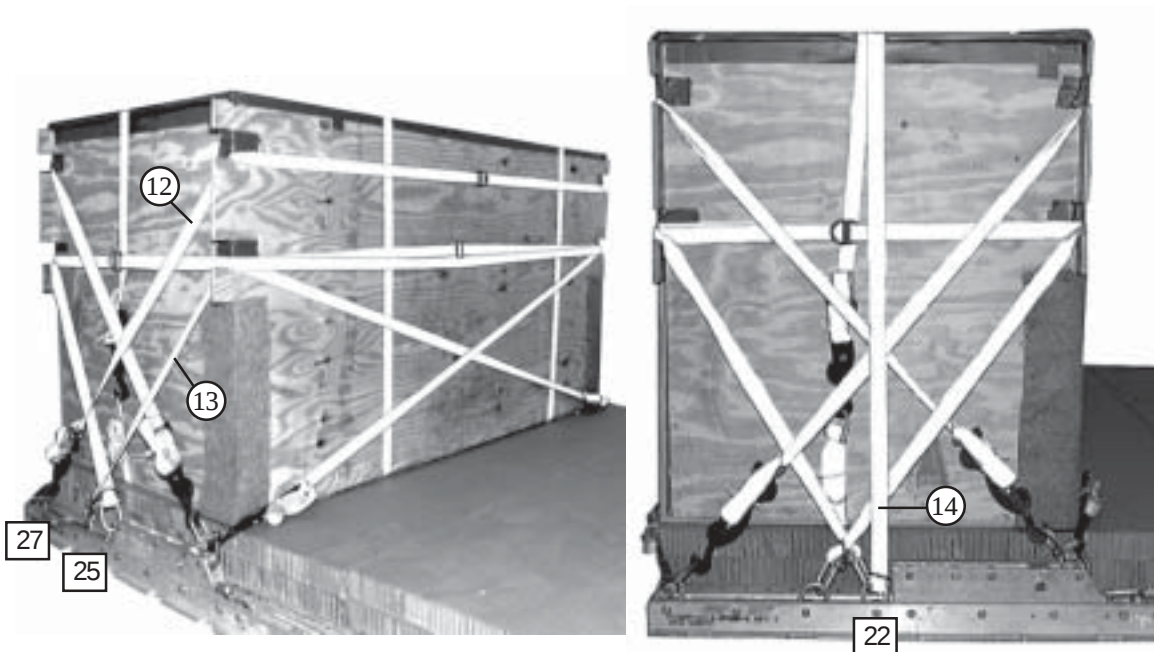


Figure 4-20. Lashings 10 and 11 Installed



Lashing Number	Tie-down Clevis Number	Instructions
12	27 and 27A	Route a 30-foot lashing from clevis 27 to the front top cutouts, to clevis 27A.
13	25 and 25A	Route a lashing through it's own D-ring on clevis 25 to the front bottom right cutout, to the front bottom left cutout to clevis 25A.
14	22 and 22A	Route a lashing through it's own D-ring on clevis 22, repeat on clevis 22A and load bind on the left side of the box.

Figure 4-21. Lashings 12 Through 14 Installed

POSITIONING AND LASHING THE DRUMS

4-10. Position and lash the fuel drums to the platform as shown in Figures 4-22 through 4-29.

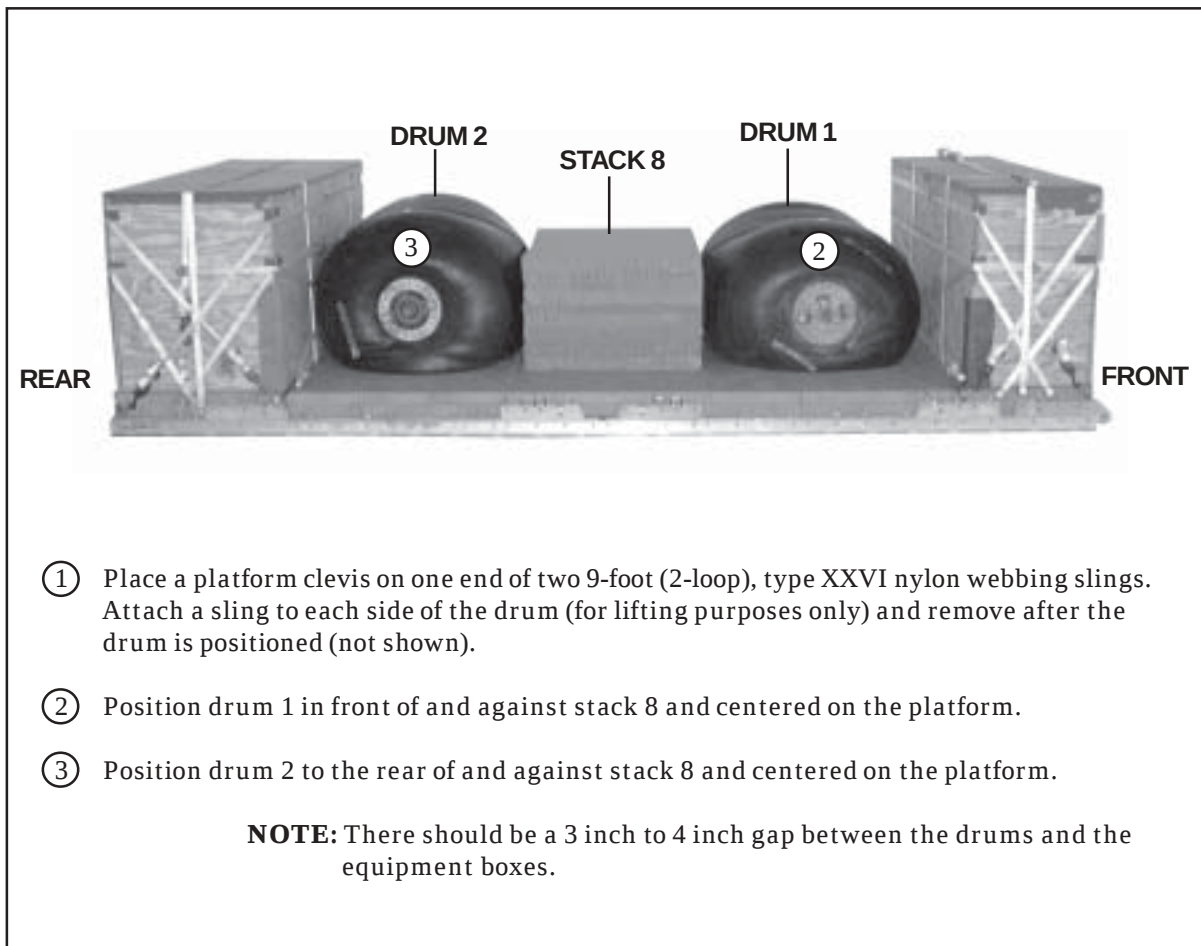


Figure 4-22. Fuel Drums 1 and 2 Positioned

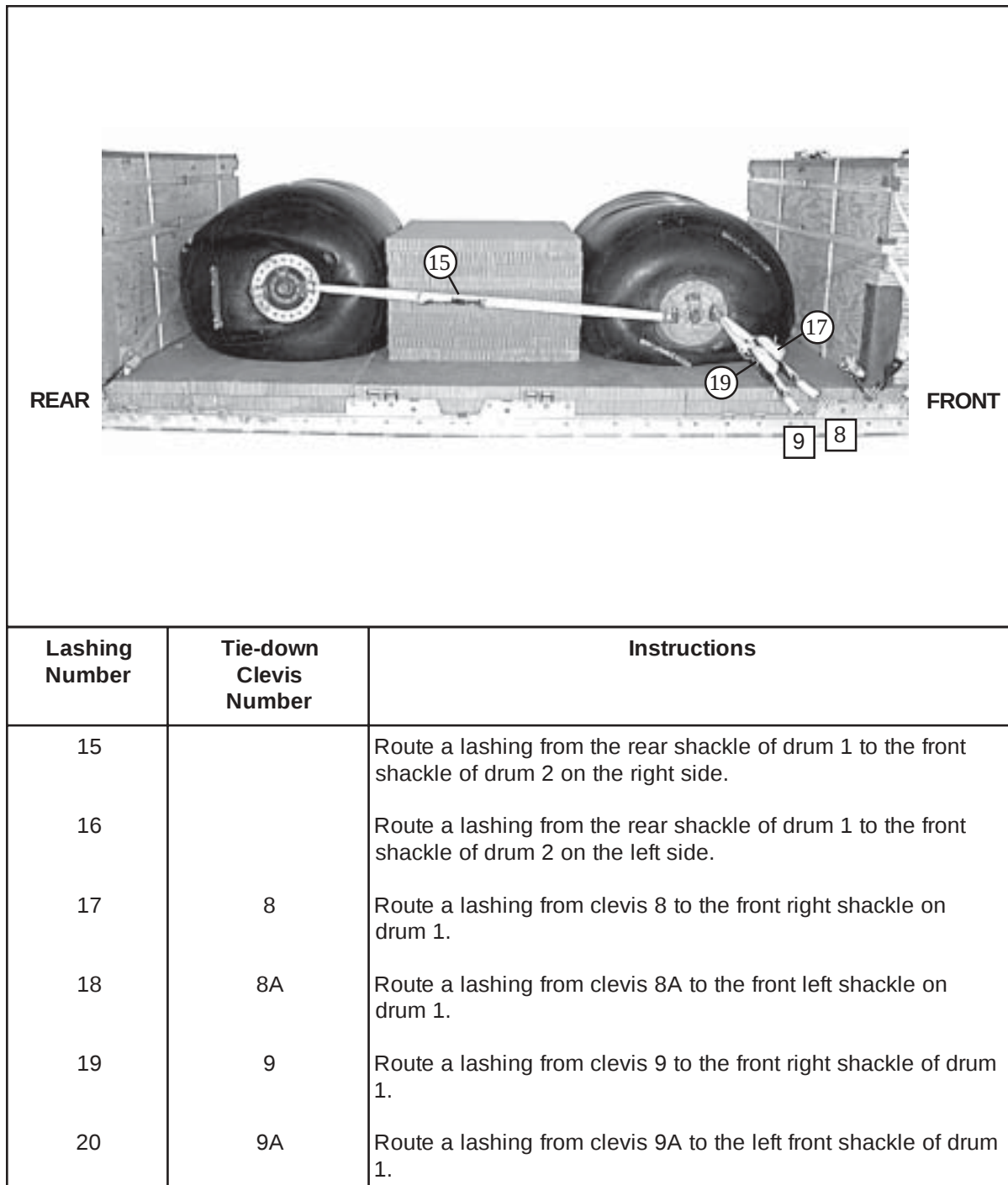


Figure 4-23. Lashings 15 through 20 Installed

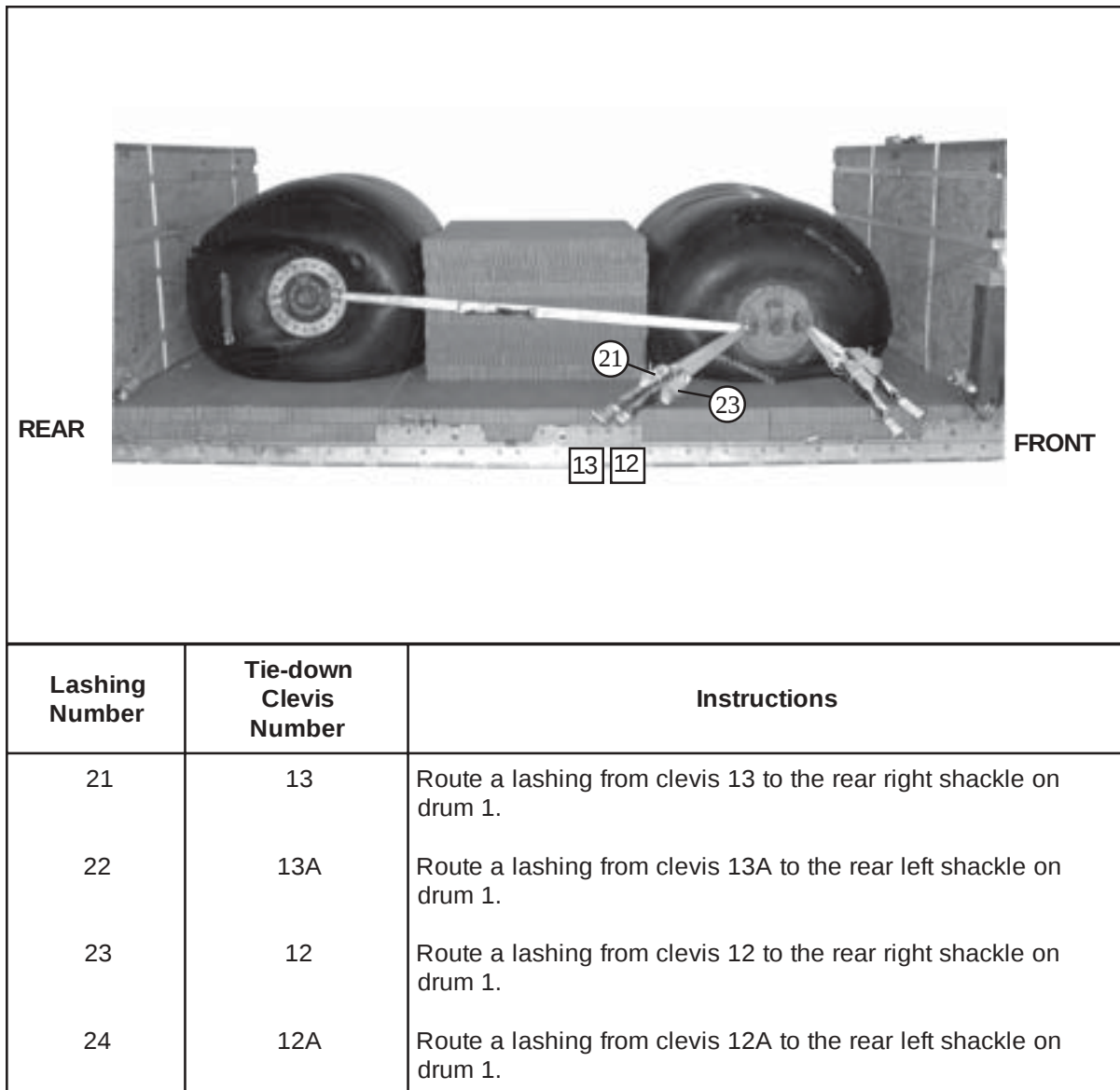


Figure 4-24. Lashings 21 through 24 Installed

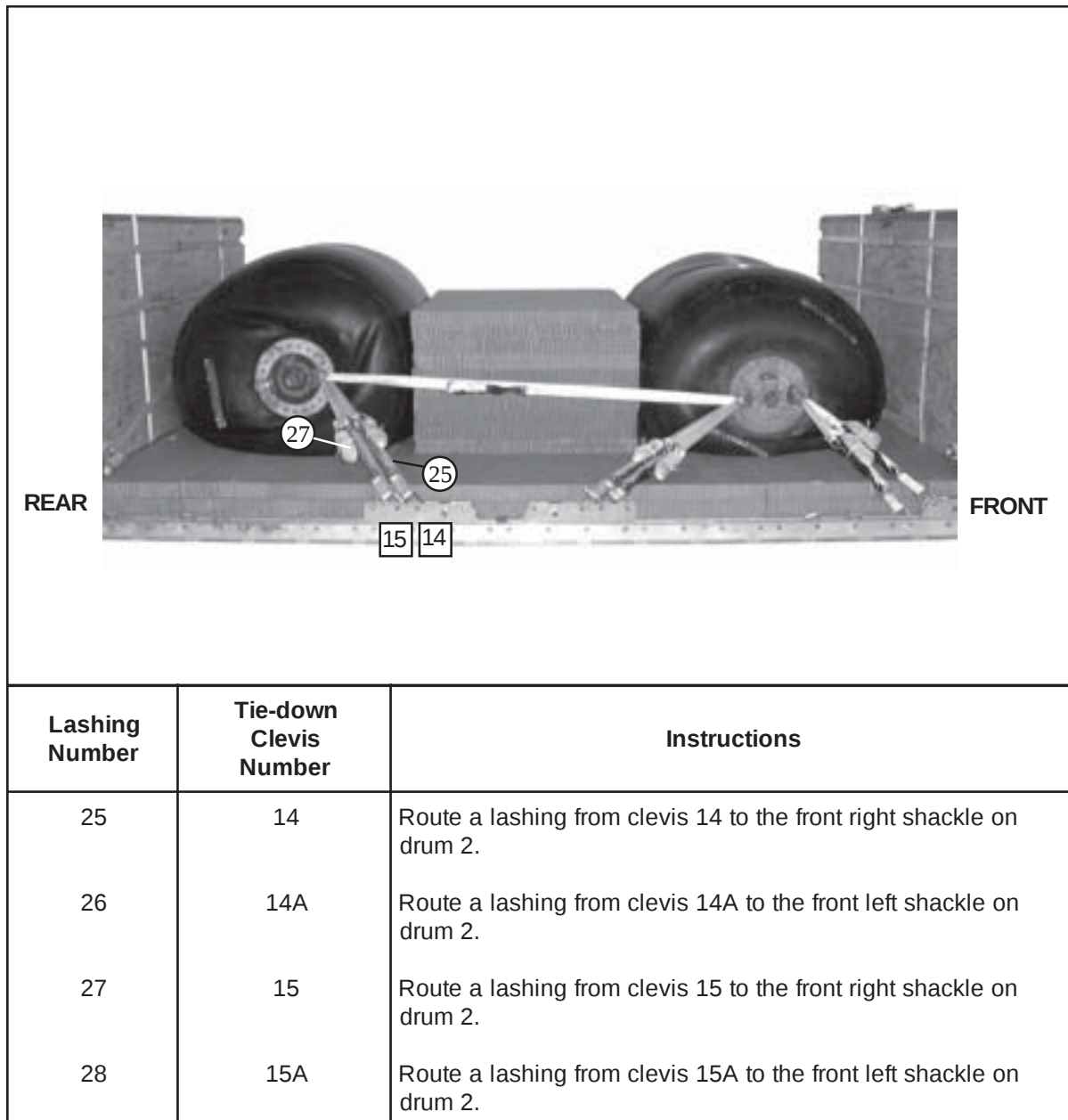


Figure 4-25. Lashings 25 through 28 Installed

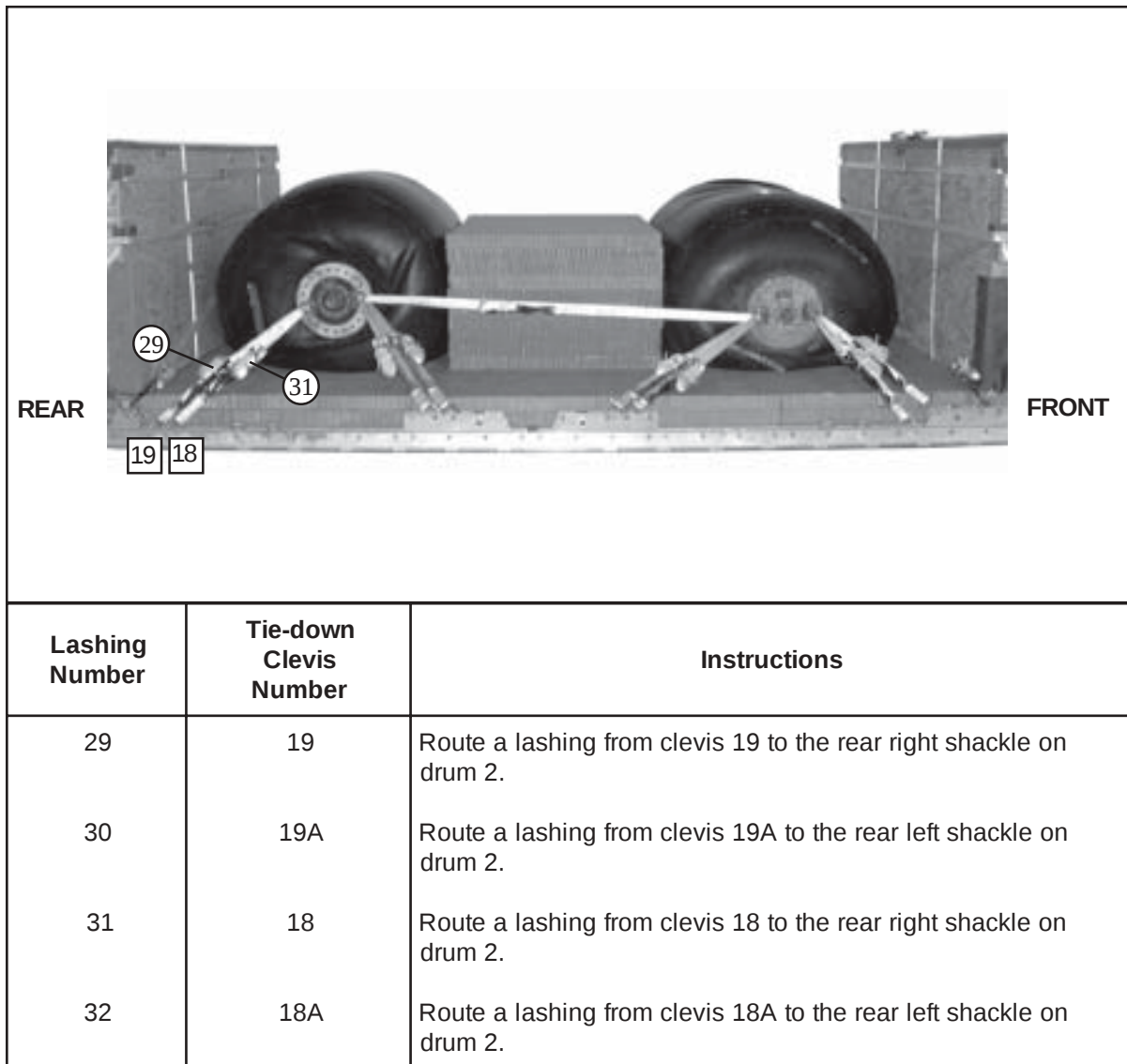


Figure 4-26. Lashings 29 through 32 Installed

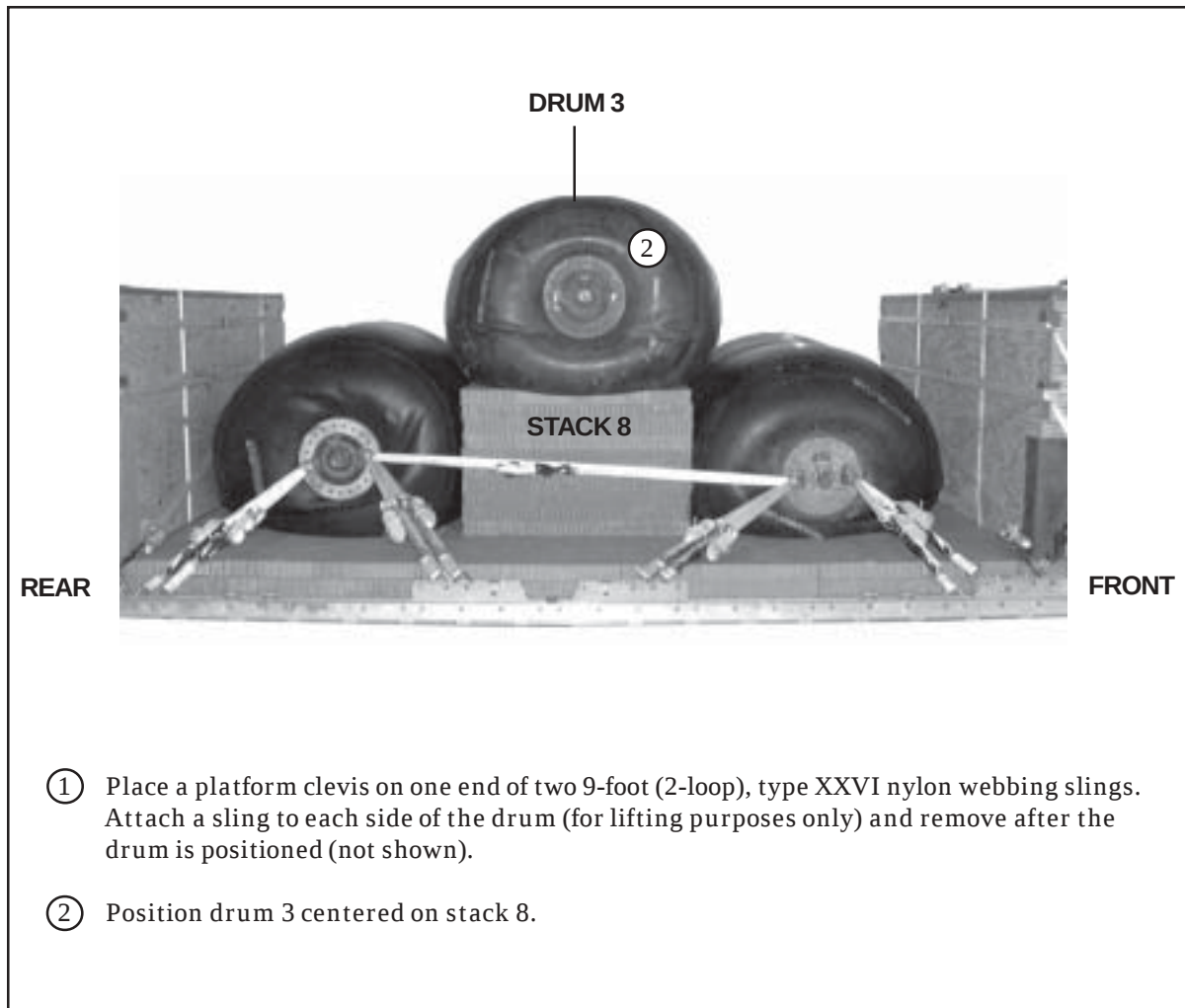


Figure 4-27. Fuel Drum 3 Positioned

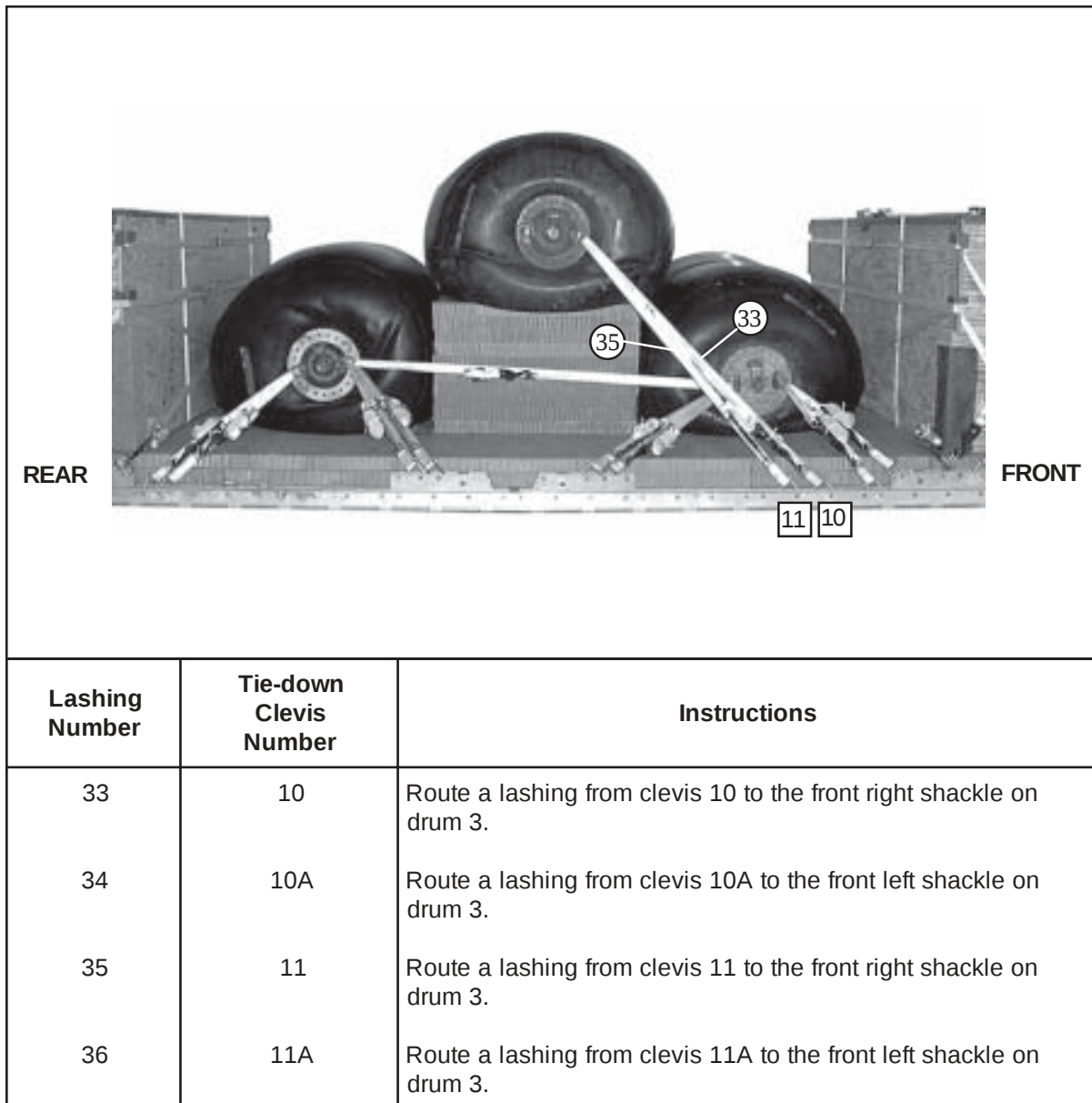


Figure 4-28. Lashings 33 through 36 Installed

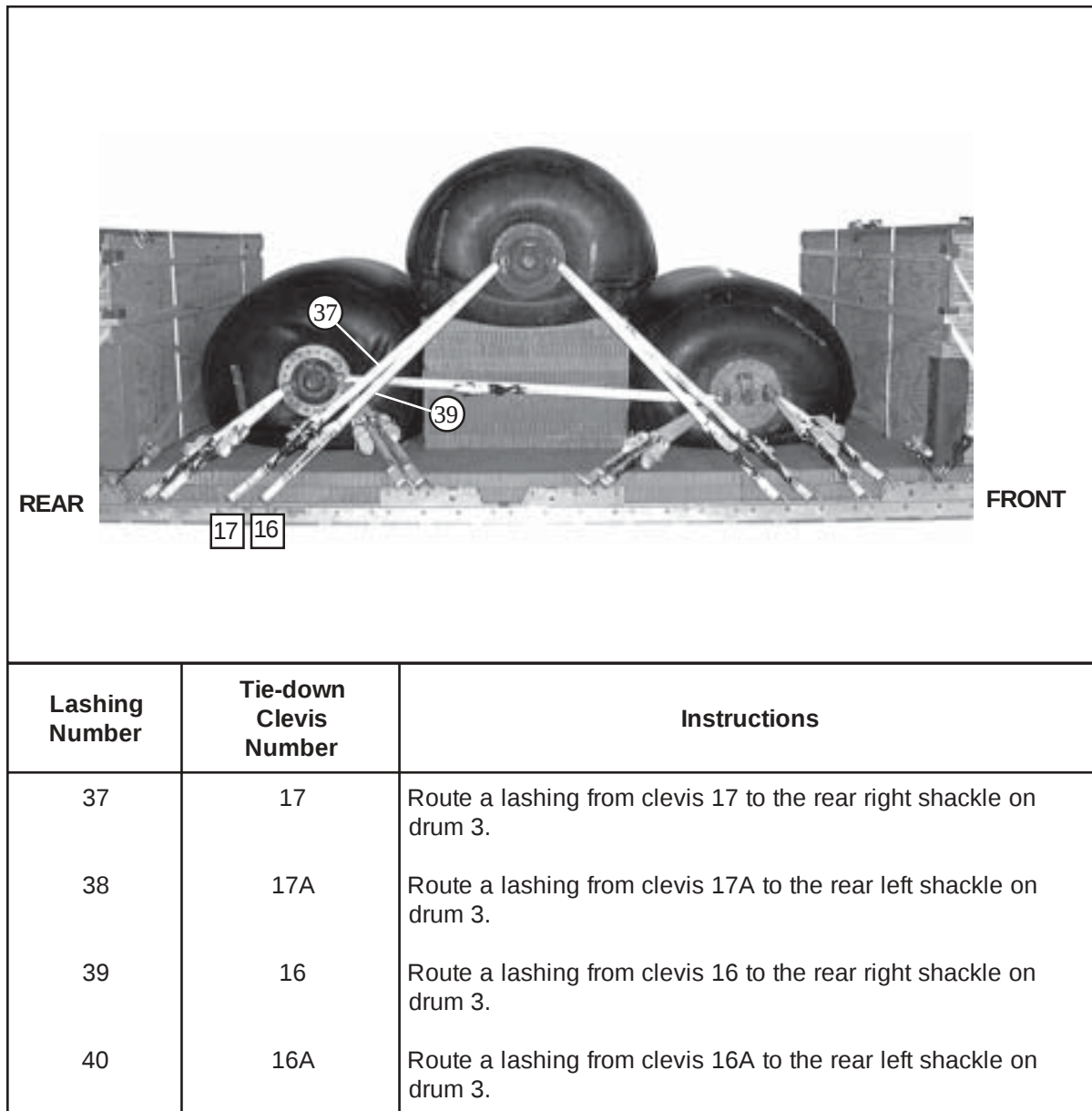


Figure 4-29. Lashings 37 through 40 Installed

BUILDING AND POSITIONING RELEASE PLATFORM

4-11. Build and position the release platform as shown in Figure 4-30.

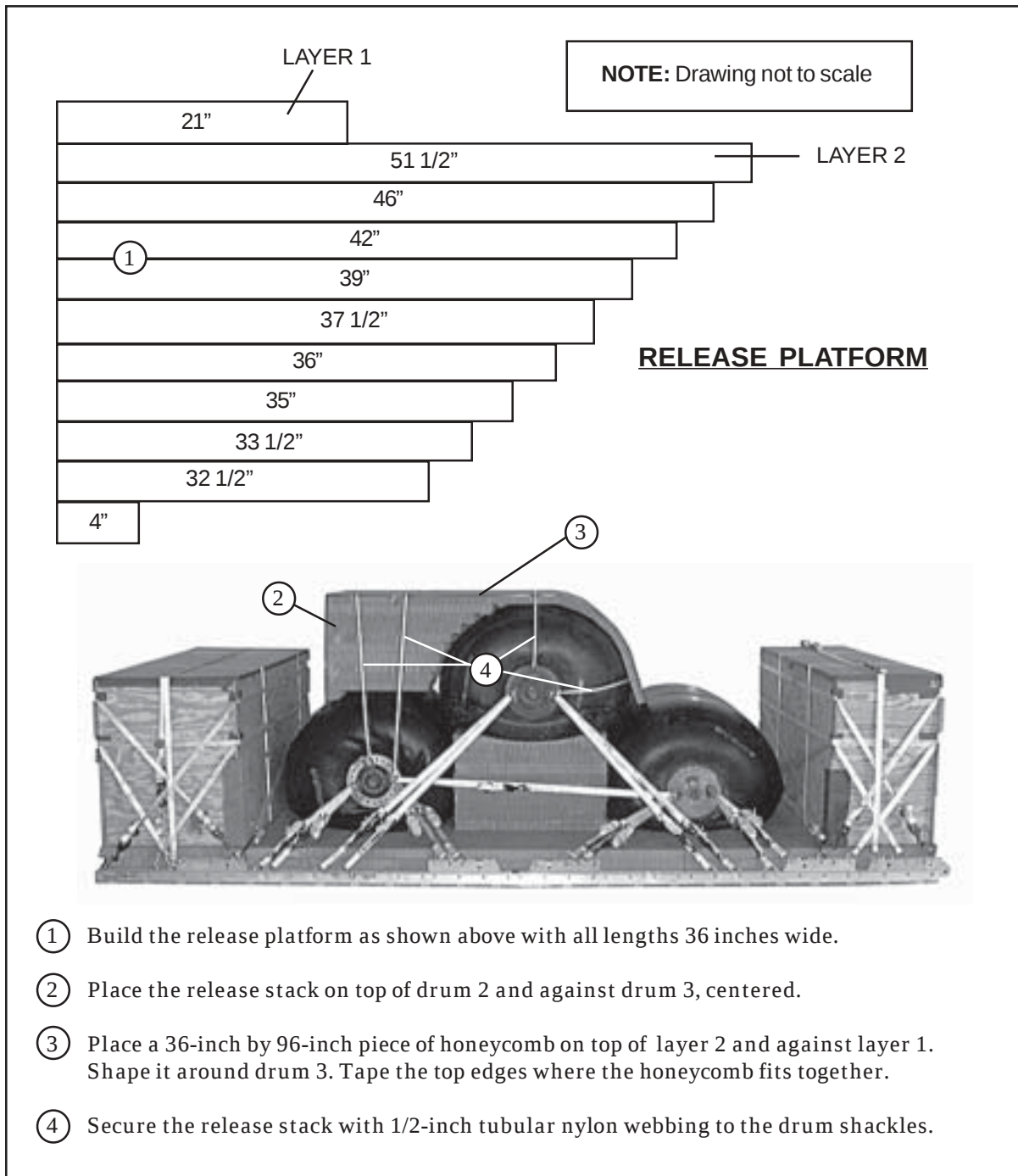


Figure 4-30. Release Platform Built and Positioned

INSTALLING SUSPENSION SLINGS AND SAFETY TIES

4-12. Install suspension slings and safety ties as shown in Figure 4-31.

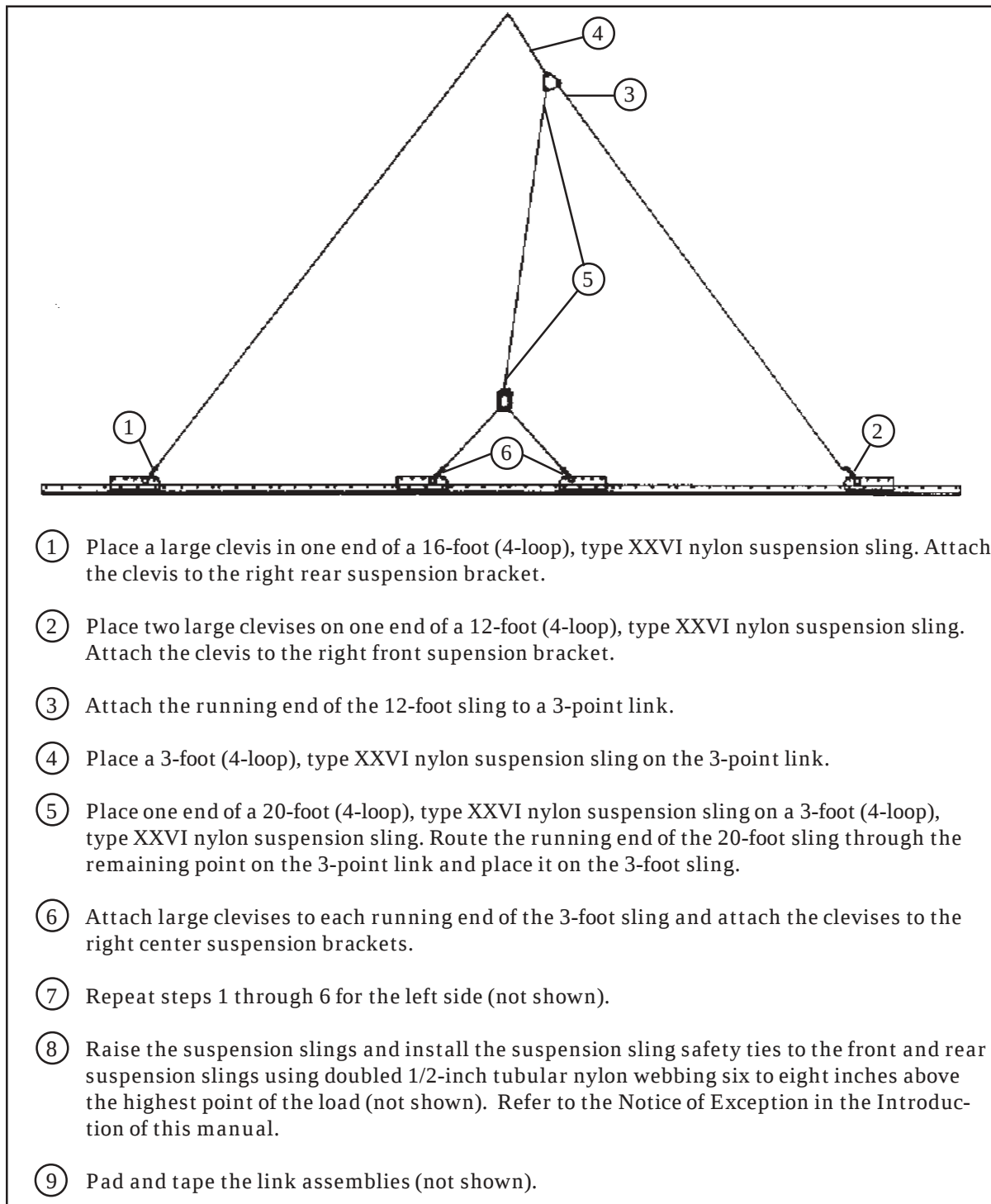


Figure 4-31. Suspension Slings and Safety Ties Installed

PREPARING AND STOWING CARGO PARACHUTES

4-13. Prepare and stow four G-11 cargo parachutes as shown in Figure 4-32.

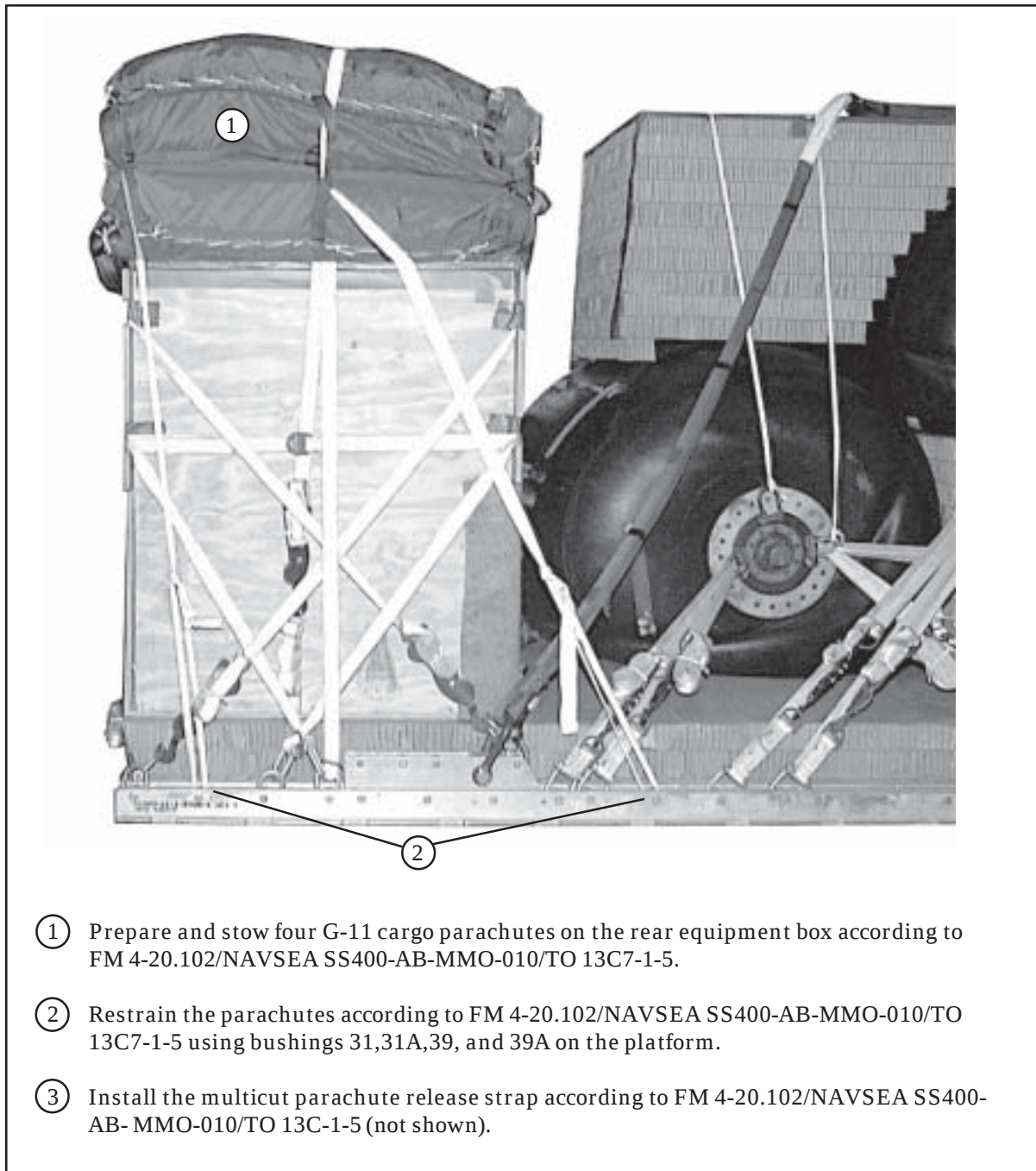


Figure 4-32. Cargo Parachutes Prepared and Stowed

INSTALLING THE EXTRACTION SYSTEM

4-14. Install the extraction system as shown in Figure 4-33.

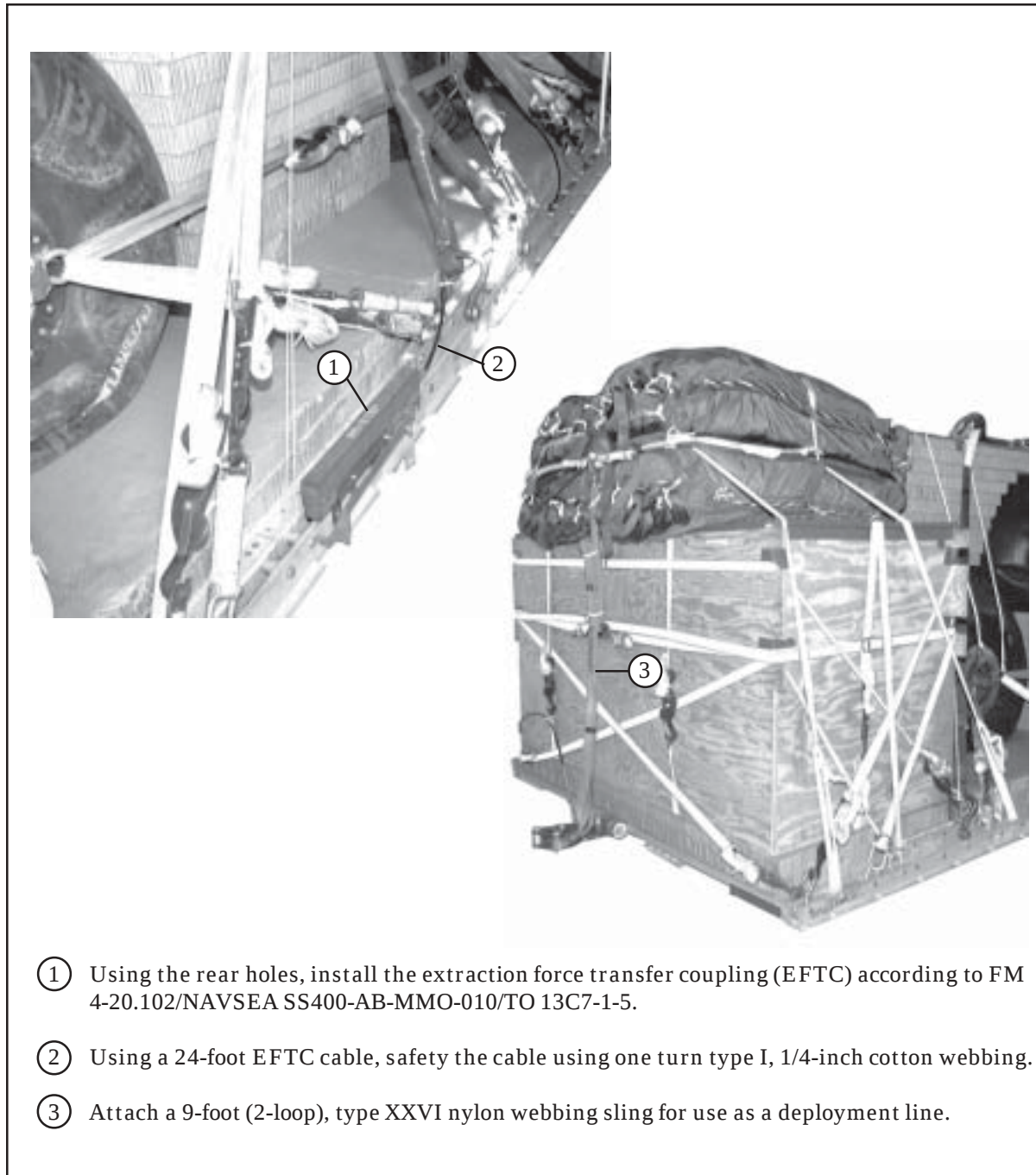
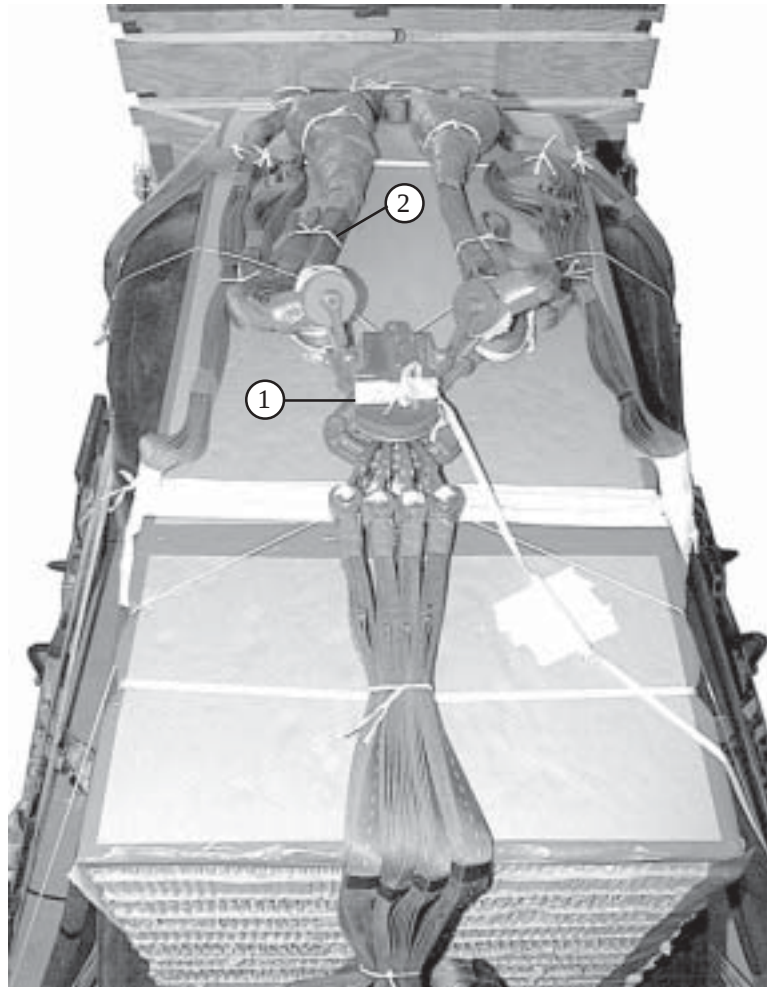


Figure 4-33. Extraction System Installed

INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-15. Install the M-2 cargo parachute release system as shown in Figure 4-34.



- ① Place the M-2 release on the release platform. Attach the suspension slings and the parachute riser extensions to the M-2 cargo parachute release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.
- ② S-fold and tie any slack in the suspension slings with 1/4-inch cotton webbing.

Figure 4-34. Cargo Parachute Release Installed

PLACING EXTRACTION PARACHUTE

4-16. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

4-17. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

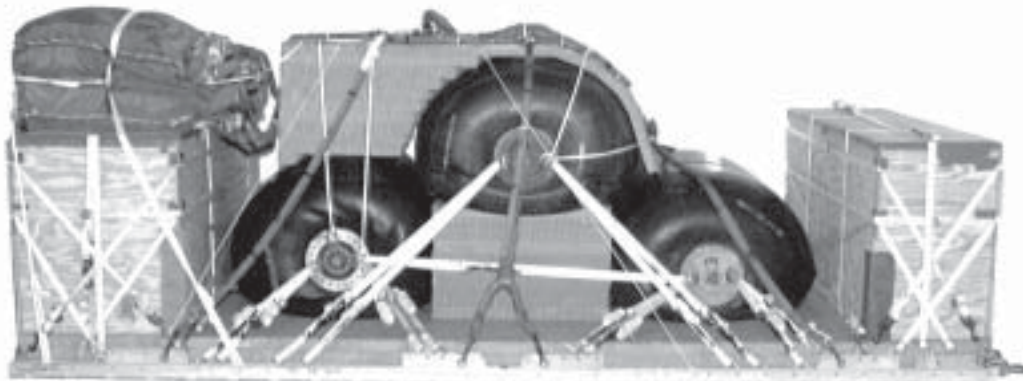
4-18. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-35. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

4-19. Use the equipment list in Table 4-2 to rig the load shown in Figure 4-35.

CAUTION

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.



CB

RIGGED LOAD DATA

Weight	18,501 pounds
Maximum Weight	20,000 pounds
Height	88 inches
Width	108 inches
Overall Length	258 inches
Overhang: Front	0 inches
Overhang: Rear	18 inches
Center of Balance (CB) (from front edge of platform)	121 inches

Figure 4-35. AAFARS with Three 500-Gallon Drums Rigged

Table 4-2. Equipment Required for Rigging AAFARS With Three 500-Gallon Drums

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (C-17 only)	1
4030-00-090-5354	Clevis, large	11
4030-00-678-8562	Clevis, medium	4
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-360-0328	Cover, clevis, large	4
8305-00-958-3685	Felt sheet, 1/2-inch	As required
1670-00-003-4391	Knife, parachute bag for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add 1 for DES)	2
1670-01-064-4452	Line, drogue (for C-17) 60-foot (1-loop), type XXVI	1
1670-01-062-6304	Line, deployment: 9-foot (2-loop), type XXVI	1
1670-01-062-6313	Line, extraction: For C-130: 60-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-141: 140-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-17: 140-foot (3-loop), type XXVI	1
	Link assembly:	
	Two-point:	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-3454	Plate, side, 5 1/2-in	2
5365-00-007-3414	Spacer, large	2
	Two-point, 3 3/4-in (for DES)	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2
1670-01-307-1055	Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1

Table 4-2. Equipment Required for Rigging AAFARS With Three 500-Gallon Drums (Continued)

National Stock Number	Item	Quantity
5510-00-220-6146	Lumber: 2- by 4-in	As required
5315-00-753-3885	Nail, steel wire, common, 16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	24 sheets
1670-01-016-7841	Parachute: Cargo, G-11B	4
1670-00-040-8135	Cargo, extraction, 28ft	1
1670-01-063-3715	Drogue, 15ft (for C-17)	1
1670-01-353-8425	Platform, airdrop, type V, 20-foot: Bracket assembly, component, (EFTC)	(1)
1670-01-247-2389	Bracket, suspension	(8)
1670-01-162-2372	Clevis assembly, type V	(54)
1670-01-353-8424	Extraction bracket assembly	(1)
1670-01-162-2381	Link, tandem, suspension link assembly	(2)
5530-00-618-8073	Plywood, 3/4- by 48- by 96-in	11 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
1670-01-062-6306	Sling, cargo airdrop For suspension: 3-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6307	12-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6308	16-ft (4-loop), Type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), typeXXVI nylon webbing	2
1670-01-062-6313	For riser extension: 60-ft (3-loop), type XXVI nylon webbing	4
1670-00-040-8219	Strap, parachute release, multicut	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	61
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Type VIII	As required

SECTION II - RIGGING AAFARS WITH FOUR 500-GALLON FUEL DRUMS

DESCRIPTION OF LOAD

4-20. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 20-foot, type V airdrop platform with five G-11 parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum output of 55 GPM. There are four collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The overall length of the load is 258 inches. The load is 88 inches high. Its center of balance is 121 inches.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

4-21. Prepare a 20-foot type V airdrop platform using two tandem links, eight suspension brackets and 62 tie-down clevises as shown in Figure 4-36.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

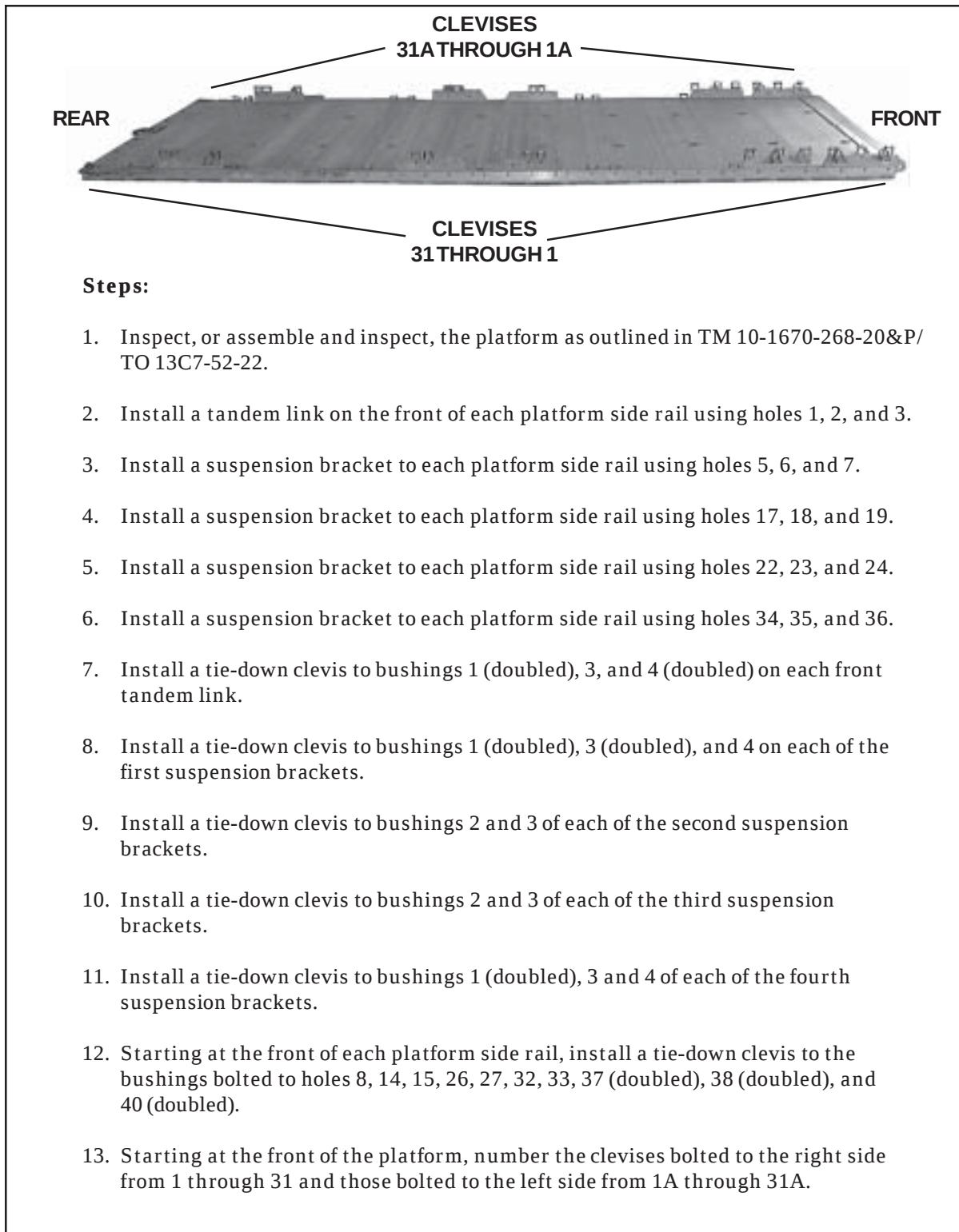


Figure 4-36. Platform Prepared

PREPARING AND POSITIONING HONEYCOMB STACKS

4-22. Prepare the honeycomb stacks as shown in Figure 4-2. Place the honeycomb stacks on the platform as shown in Figure 4-3.

BUILDING THE EQUIPMENT BOXES

4-23. Build the front and rear equipment boxes as shown in Figures 4-4 and 4-5.

PREPARING EQUIPMENT FOR EQUIPMENT BOXES

4-24. Prepare the fire extinguishers, filter separator, explosion proof motor, pumps, battery box, manuals and toolkit as explained and shown in paragraph 4-6. Using the lists printed on the equipment bags, place the equipment indicated on each list into its bag.

POSITIONING EQUIPMENT BOXES

4-25. Pre-position three lashings at each end of the platform as shown in Figure 4-13, steps 1 through 3. Position the equipment boxes flush over the ends of the honeycomb as shown in Figure 4-13, step 4. Pad the inside lower box corners as shown in Figure 4-13, step 5.

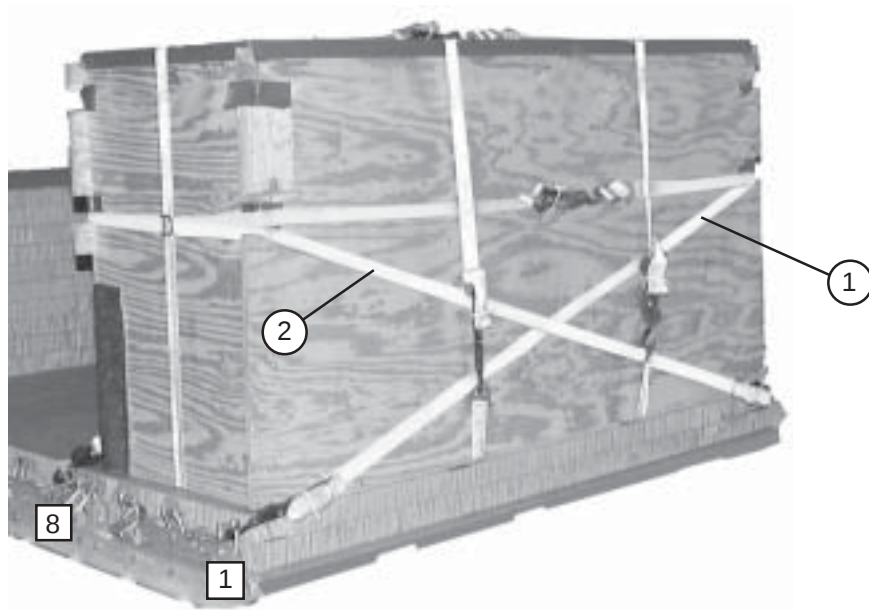
POSITIONING EQUIPMENT IN EQUIPMENT BOXES AND SECURING BOXES

4-26. Position and secure the equipment in the equipment boxes, and secure the boxes and lids as explained in paragraph 4-8, and as shown in Figures 4-14 and 4-15.

LASHING THE EQUIPMENT BOXES TO THE PLATFORM

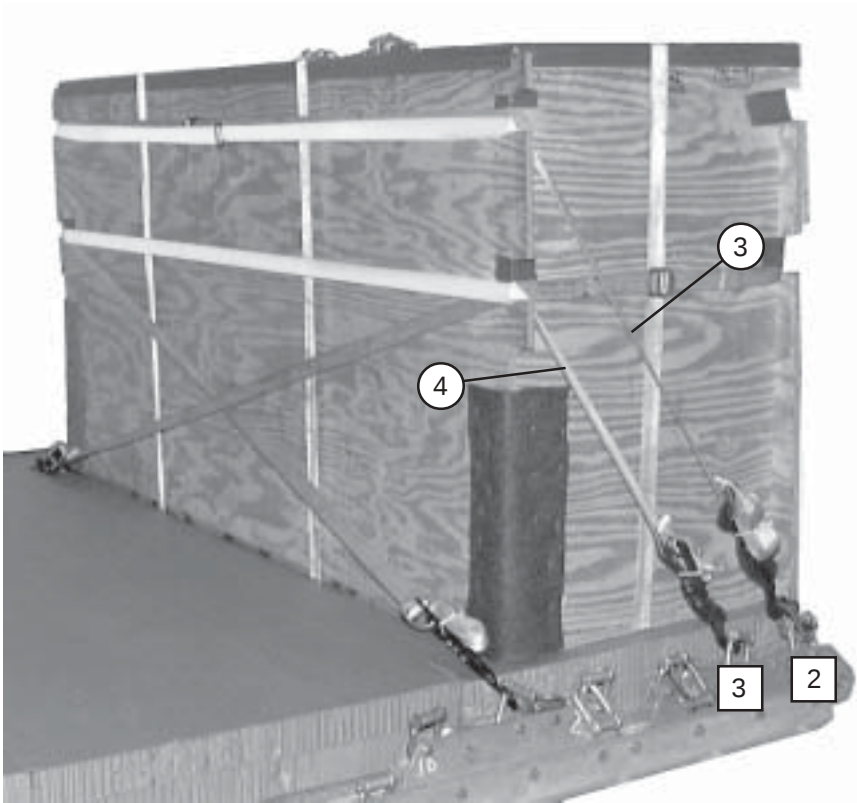
4-27. Lash the equipment boxes to the platform as given below.

- a. Lash the front equipment box to the platform as shown in Figures 4-37 through 4-39.



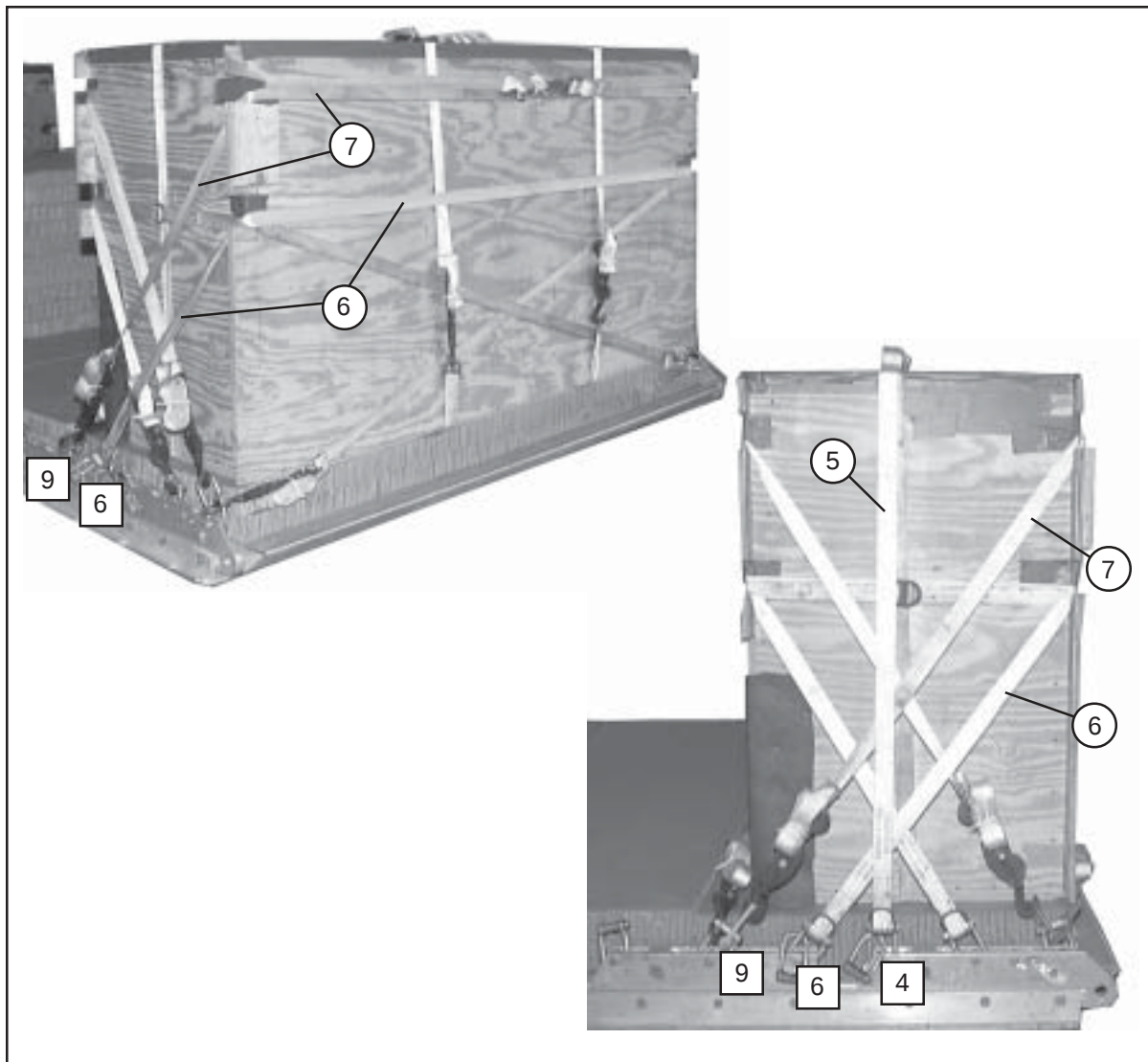
Lashing Number	Tie-down Clevis Number	Instructions
1	1 and 8	Route a 30-foot lashing from clevis 1 to the front bottom left cutout, to the rear bottom left cutout, to clevis 8.
2	1A and 8A	Route a 30-foot lashing from clevis 1A to the front bottom right cutout, to the rear bottom right cutout, to clevis 8A.

Figure 4-37. Lashings 1 and 2 Installed



Lashing Number	Tie-down Clevis Number	Instructions
3	2 and 2A	Route a 30-foot lashing from clevis 2 to the rear top right cutout, to the rear top left cutout, to clevis 2A.
4	3 and 3A	Route a lashing from clevis 3A and through its own D-ring to the rear bottom left cutout, to the rear bottom right cutout, to clevis 3.

Figure 4-38. Lashings 3 and 4 Installed



Lashing Number	Tie-down Clevis Number	Instructions
5	4 and 4A	Route a lashing through it's own D-ring on clevis 4, repeat on clevis 4A and load bind them together on top of the box.
6	6 and 6A	Route a lashing through it's own D-ring on clevis 6 to the front bottom right cutout, to the front bottom left cutout, to clevis 6A.
7	9 and 9A	Route a 30-foot lashing from clevis 9 to the front top right cutout, to the front top left cutout, to clevis 9A.

Figure 4-39. Lashings 5 through 7 Installed

b. Lash the rear equipment box to the platform as shown in Figures 4-40 through 4-42.

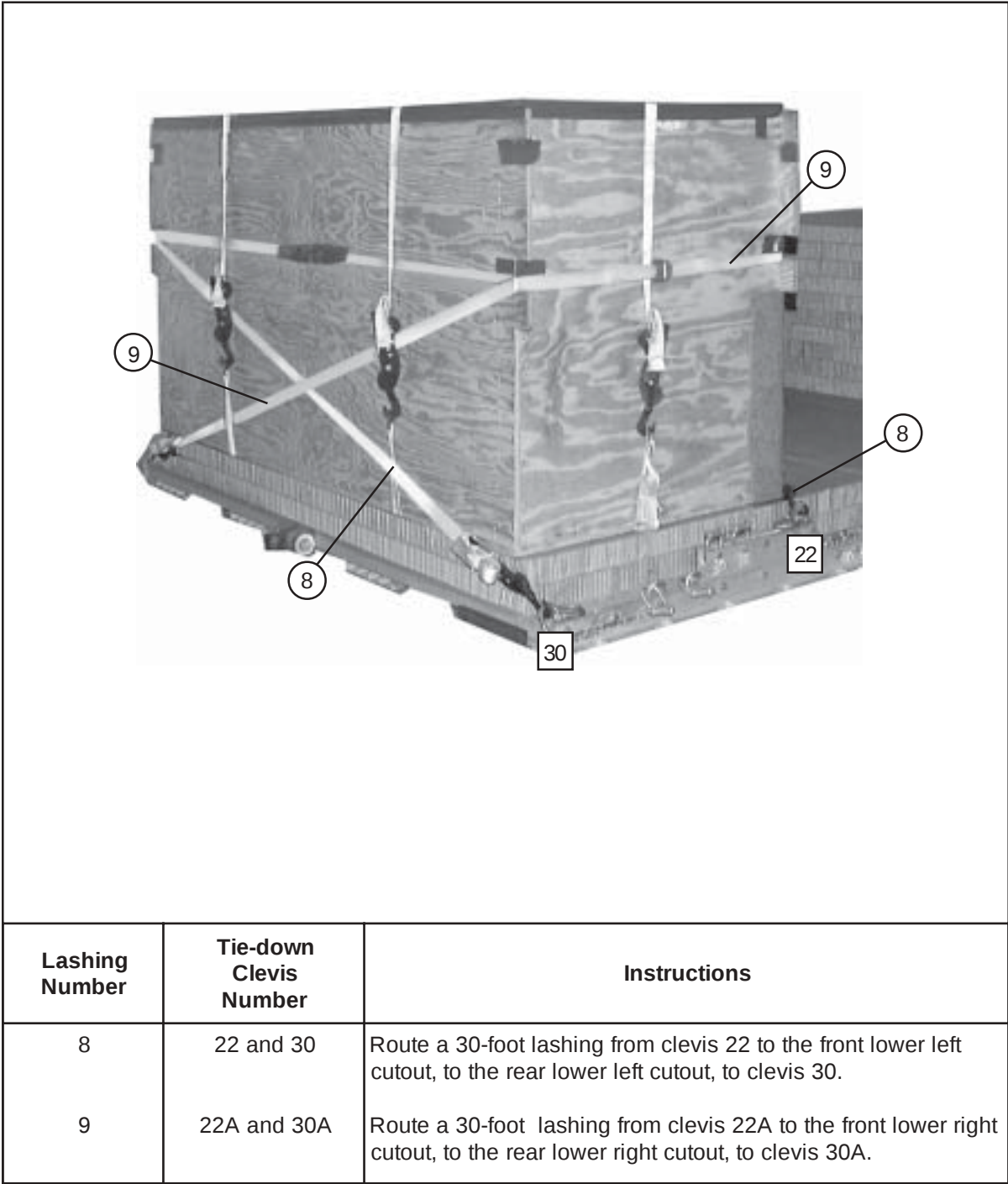
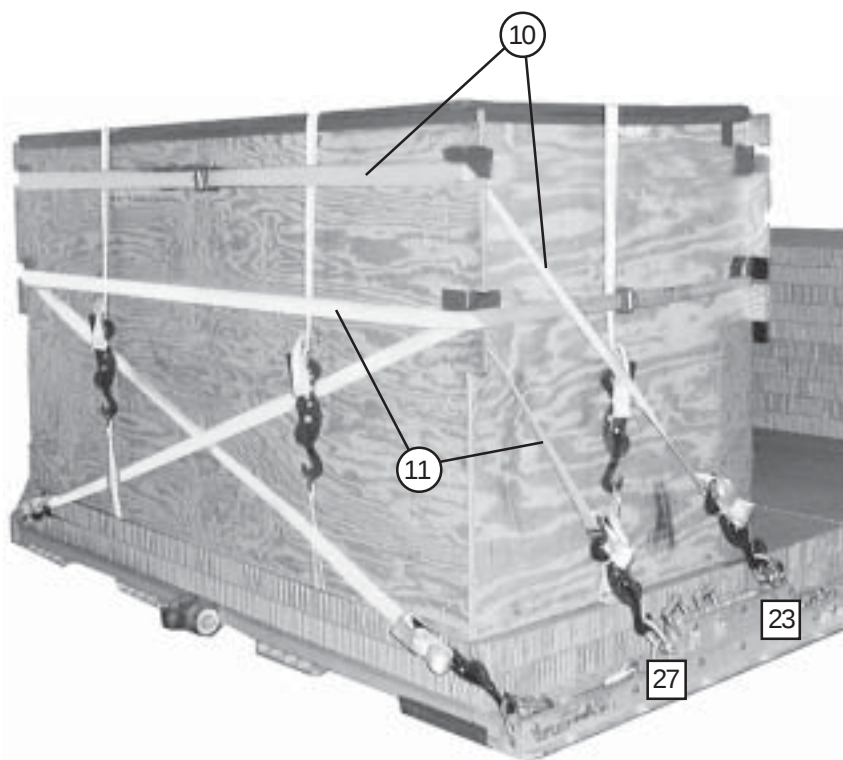


Figure 4-40. Lashings 8 and 9 Installed



Lashing Number	Tie-down Clevis Number	Instructions
10	23 and 23A	Route a 30-foot lashing from clevis 23 to the rear top right cutout, to the rear top left cutout, to clevis 23A.
11	27 and 27A	Route a lashing through it's own D-ring on clevis 27A to the rear bottom left cutout, to the rear bottom right cutout to clevis 27.

Figure 4-41. Lashings 10 and 11 Installed

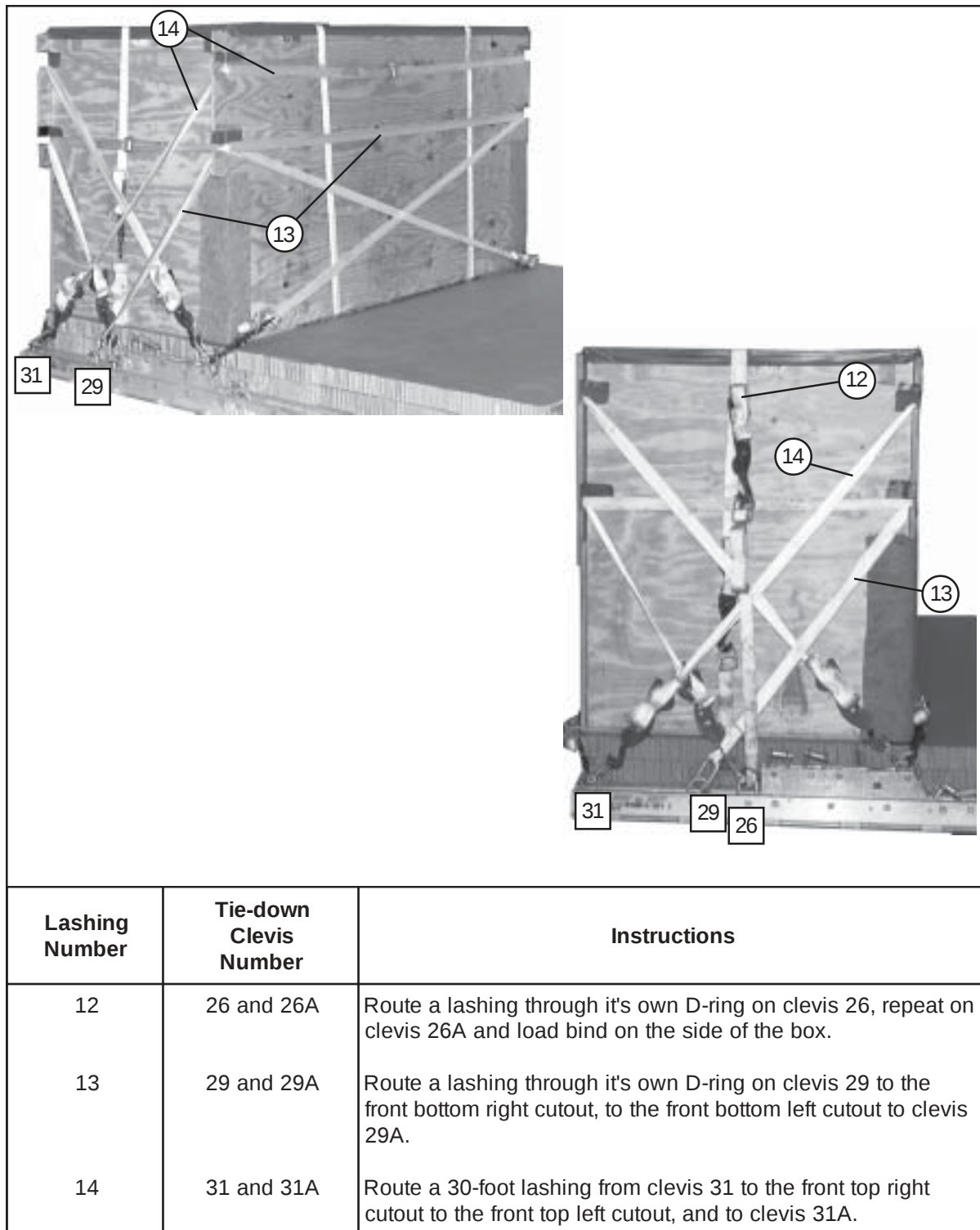


Figure 4-42. Lashings 12 through 14 Installed

POSITIONING AND LASHING DRUMS

4-28. Position four fuel drums and lash them to the platform as shown in Figures 4-43 through 4-49.

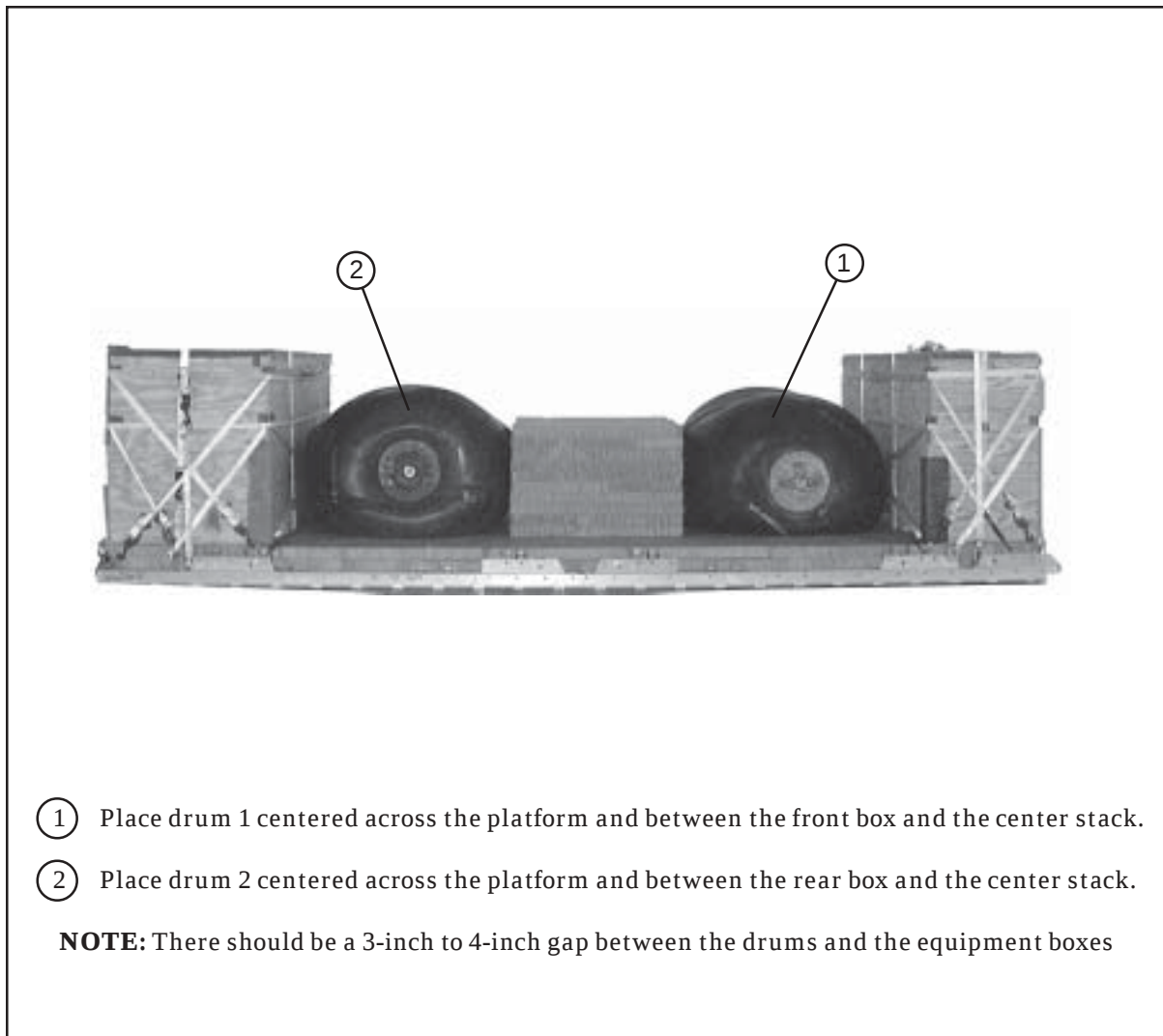


Figure 4-43. Drums 1 and 2 Placed

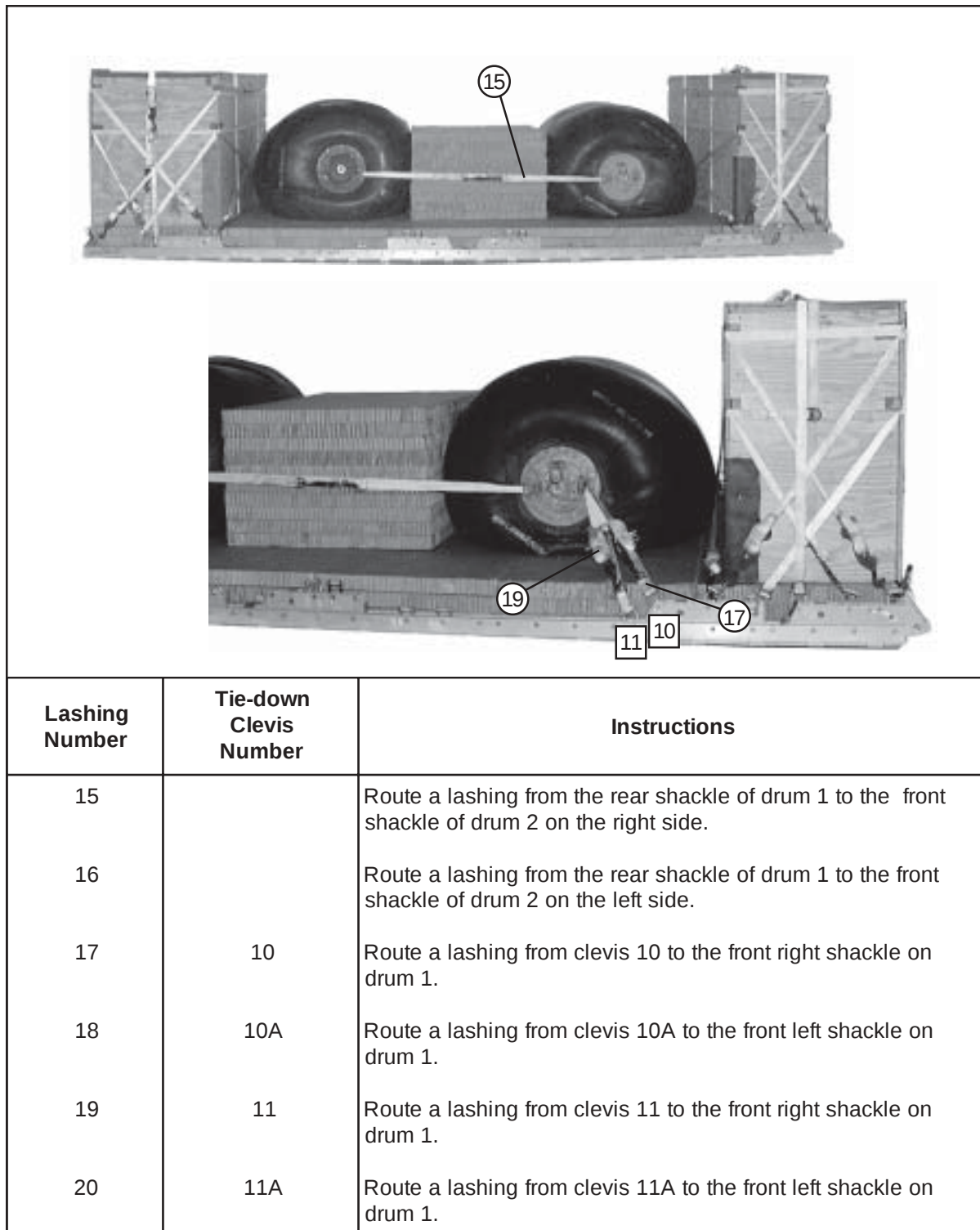
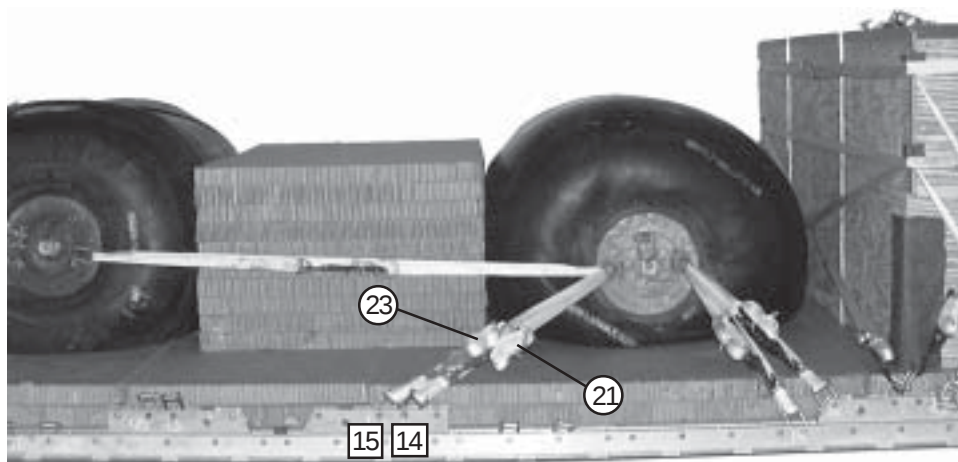


Figure 4-44. Lashings 15 through 20 Installed



Lashing Number	Tie-down Clevis Number	Instructions
21	14	Route a lashing from clevis 14 to the rear right shackle on drum 1.
22	14A	Route a lashing from clevis 14A to the rear left shackle on drum 1.
23	15	Route a lashing from clevis 15 to the rear right shackle on drum 1.
24	15A	Route a lashing from clevis 15A to the rear left shackle on drum 1.

Figure 4-45. Lashings 21 through 24 Installed

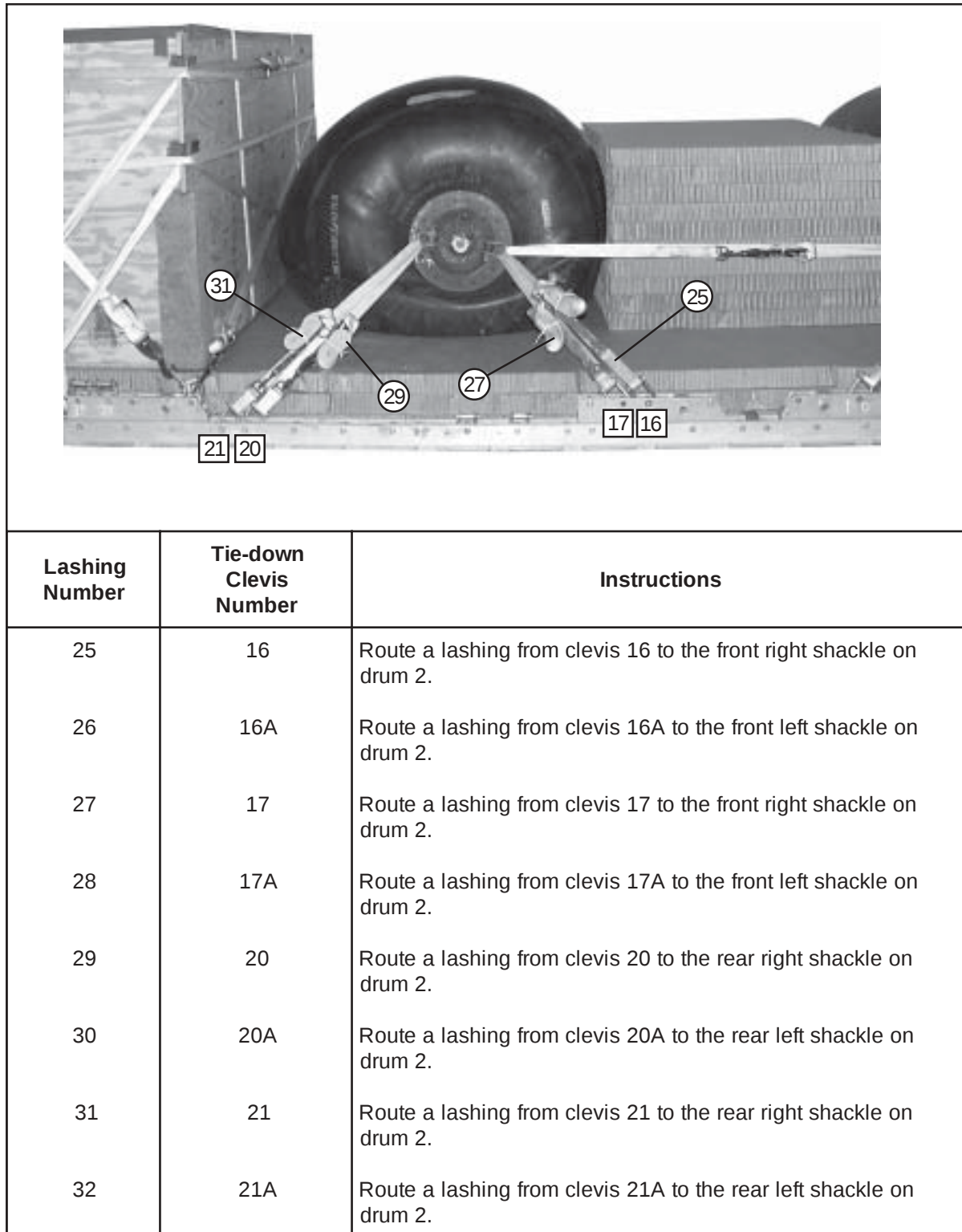
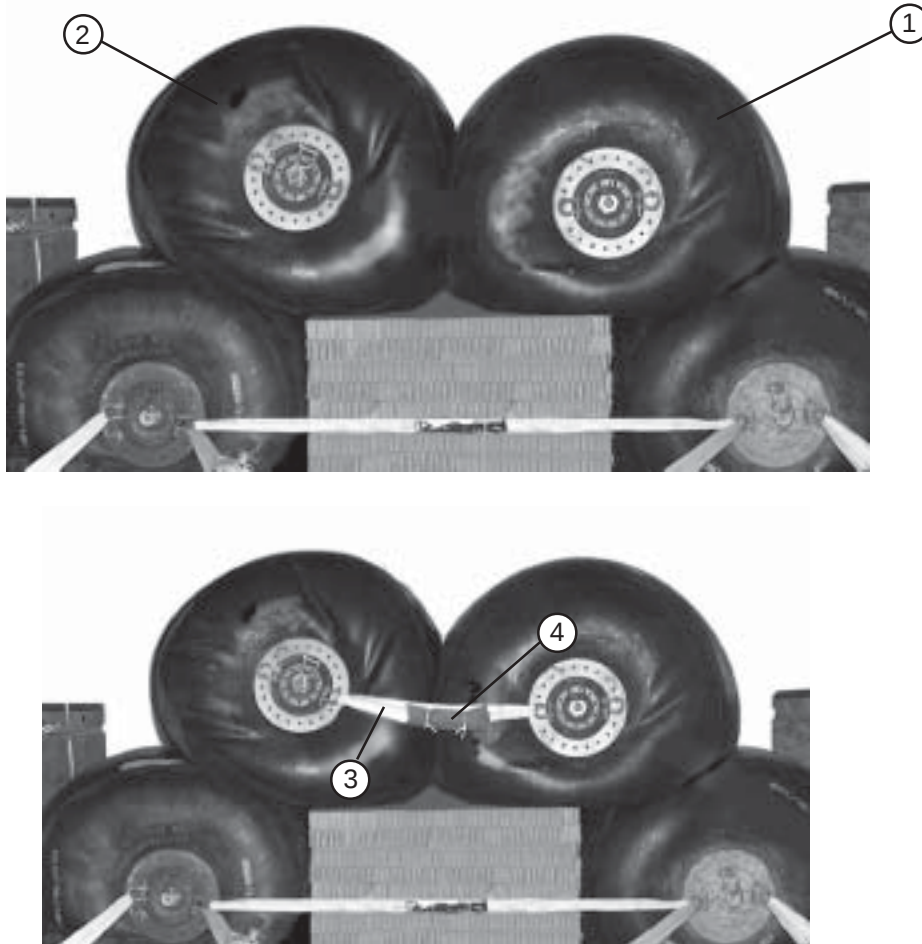
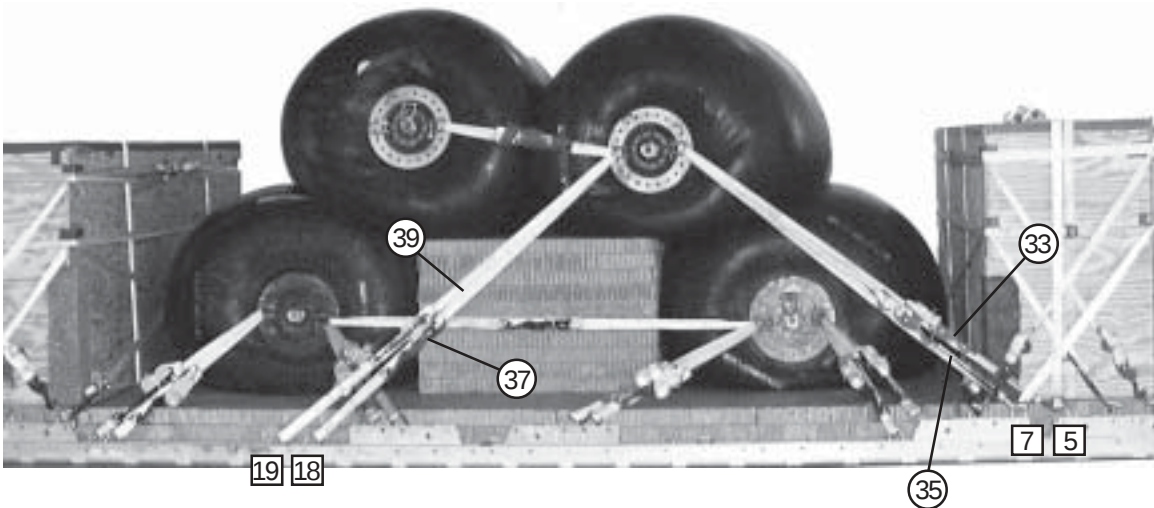


Figure 4-46. Lashings 25 through 32 Installed



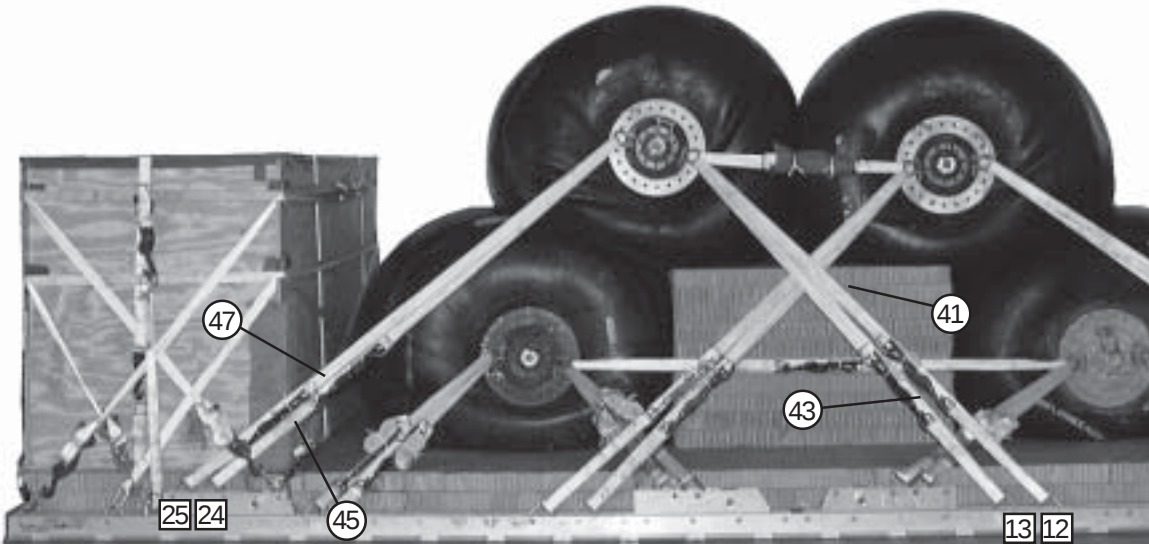
- ① Position drum 3 at the front of the center stack, resting against drum 1.
- ② Position drum 4 at the rear of the center stack, resting against drum 2.
- ③ Lash drums 3 and 4 together on each side, using the inside shackles and a 15-foot lashing.
- ④ Pad each load binder with a 10- by 15-inch piece of felt. Tie the felt in place with two lengths of type I, 1/4-inch cotton webbing.

Figure 4-47. Drums 3 and 4 Positioned



Lashing Number	Tie-down Clevis Number	Instructions
33	5	Route a lashing from clevis 5 to the front right shackle on drum 3.
34	5A	Route a lashing from clevis 5A to the front left shackle on drum 3.
35	7	Route a lashing from clevis 7 to the front right shackle on drum 3.
36	7A	Route a lashing from clevis 7A to the front left shackle on drum 3.
37	18	Route a lashing from clevis 18 to the rear right shackle on drum 3.
38	18A	Route a lashing from clevis 18A to the rear left shackle on drum 3.
39	19	Route a lashing from clevis 19 to the rear right shackle on drum 3.
40	19A	Route a lashing from clevis 19A to the rear left shackle on drum 3.

Figure 4-48. Lashings 33 through 40 Installed

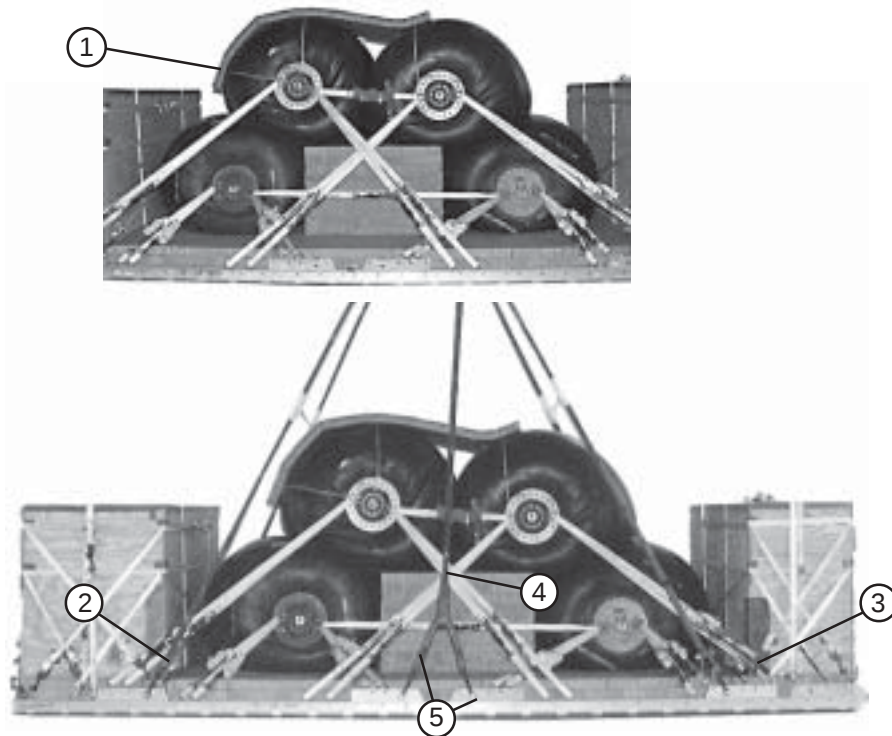


Lashing Number	Tie-down Clevis Number	Instructions
41	12	Route a lashing from clevis 12 to the front right shackle on drum 4.
42	12A	Route a lashing from clevis 12A to the front left shackle on drum 4.
43	13	Route a lashing from clevis 13 to the front right shackle on drum 4.
44	13A	Route a lashing from clevis 13A to the front left shackle on drum 4.
45	24	Route a lashing from clevis 24 to the rear right shackle on drum 4.
46	24A	Route a lashing from clevis 24A to the rear left shackle on drum 4.
47	25	Route a lashing from clevis 25 to the rear right shackle on drum 4.
48	25A	Route a lashing from clevis 25A to the rear left shackle on drum 4.

Figure 4-49. Lashings 41 through 48 Installed

INSTALLING RELEASE PLATFORM, SUSPENSION SLINGS AND SAFETY TIES

4-29. Install the release platform, suspension slings and safety ties as shown in Figure 4-50.



- ① Tie a 36- by 96-inch piece of honeycomb over drums 3 and 4 as shown with type III nylon cord. Tape edges of honeycomb.
- ② Place a large clevis in one end of a 16-foot (4-loop), type XXVI nylon suspension sling. Attach the clevis to the right rear suspension bracket.
- ③ Place two large clevises on one end of a 12-foot (4-loop), type XXVI nylon suspension sling. Attach the lower clevis to the right front suspension bracket. Safety tie them together with type III nylon cord using an hourglass tie.
- ④ Place one end of a 20-foot (4-loop), type XXVI nylon suspension sling on a 3-foot (4-loop), type XXVI nylon suspension sling. Route the running end of the 20-foot sling through a point on a 3-point link and place it on the 3-foot sling.
- ⑤ Attach large clevises to each running end of the 3-foot sling and attach the clevises to the right center suspension brackets.

Figure 4-50. Release Platform, Suspension Slings and Safety Ties Installed

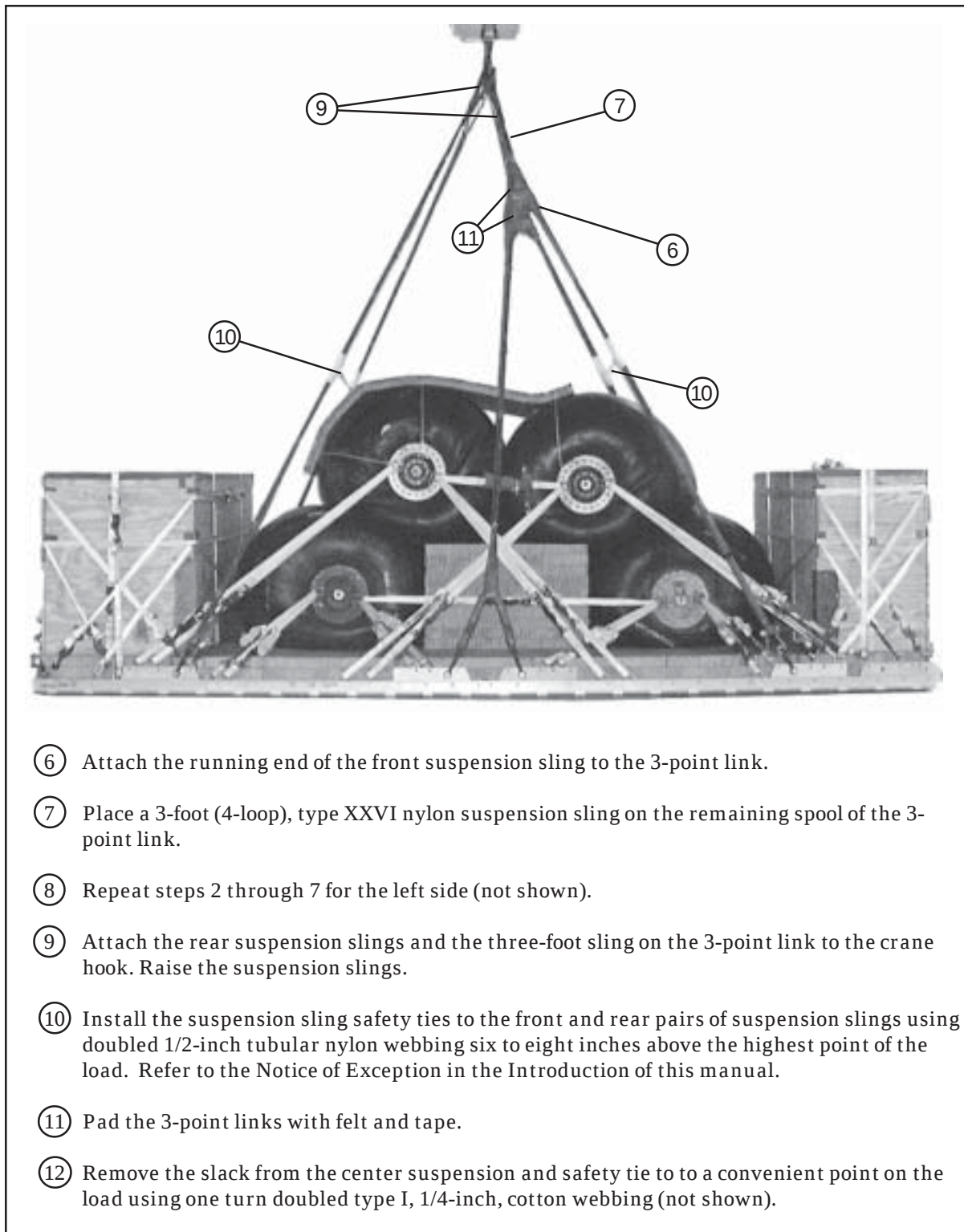


Figure 4-50. Release Platform, Suspension Slings and Safety Ties Installed (continued)

PREPARING AND STOWING CARGO PARACHUTES

4-30. Prepare and stow five G-11 cargo parachutes as shown in Figure 4-51.

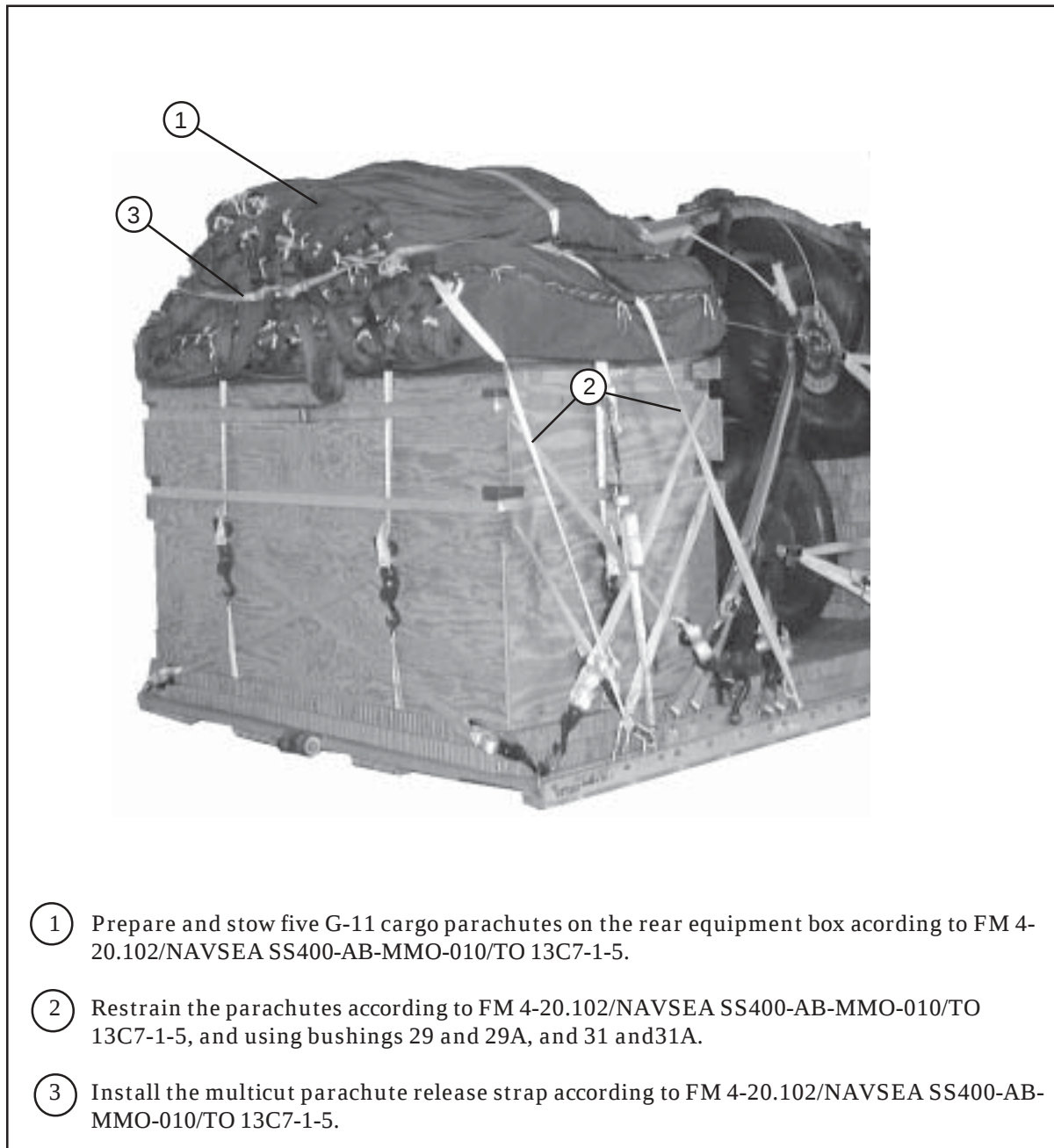
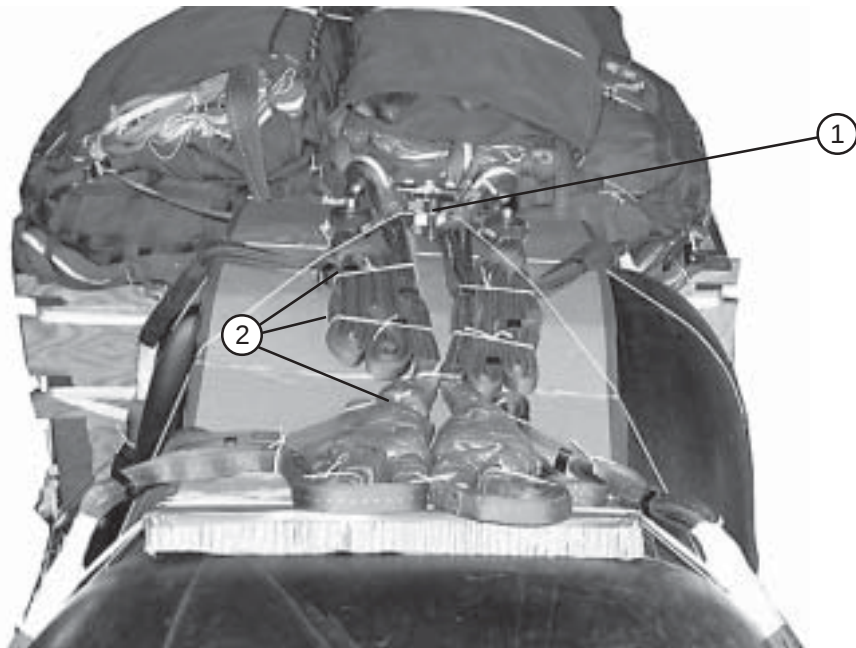


Figure 4-51. Cargo Parachutes Prepared and Stowed

INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-31. Install the parachute release as shown in Figure 4-52.



- ① Place the M-2 release on the release platform. Attach the suspension slings and the parachute riser extensions to the M-2 cargo parachute release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.
- ② S-fold and tie any slack in the suspension slings with 1/4-inch cotton webbing.

Figure 4-52. Cargo Parachute Release Release Installed

INSTALLING THE EXTRACTION SYSTEM

4-32. Install the components of the EFTC system as shown in Figure 4-53.

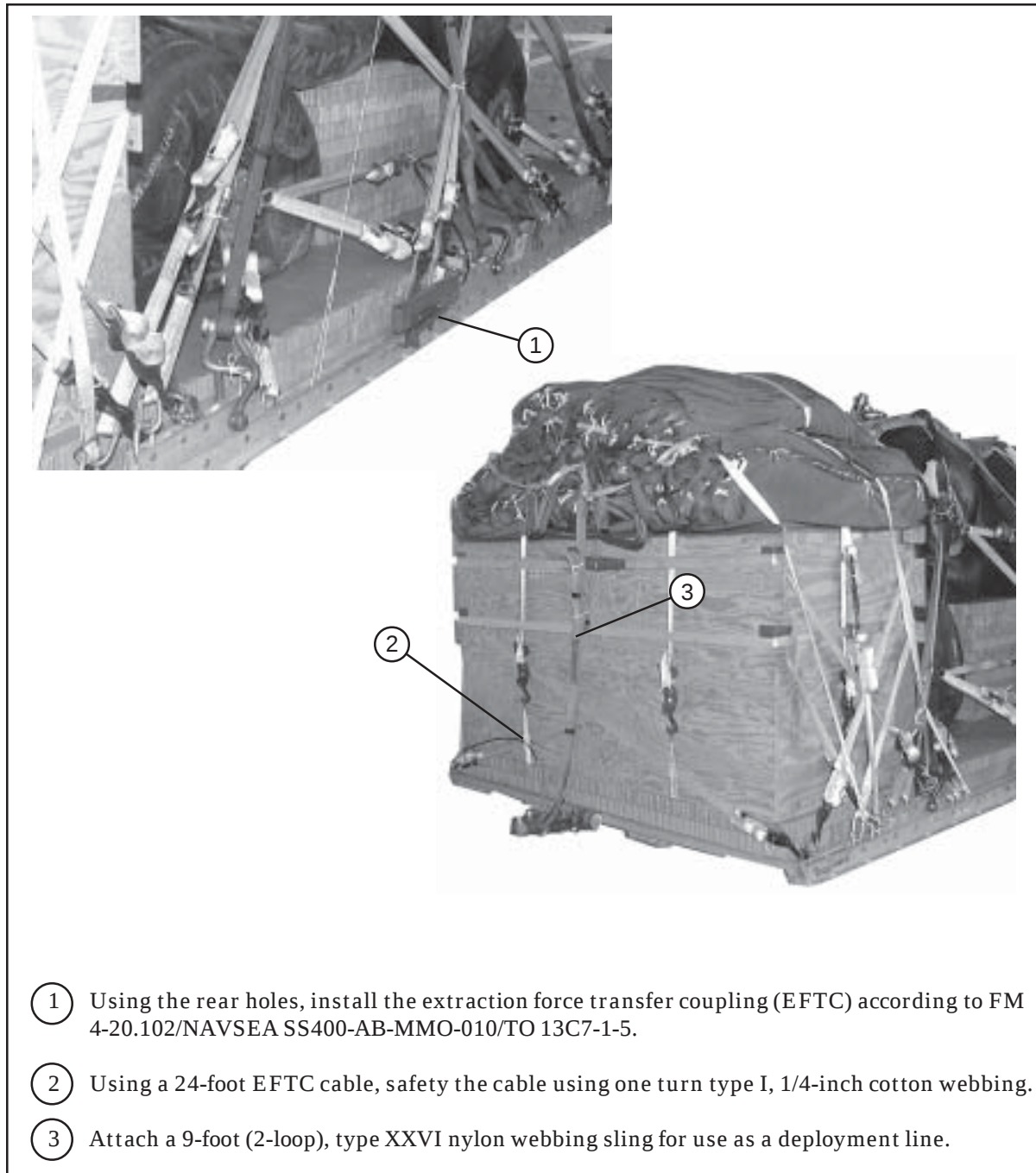


Figure 4-53. Extraction System Installed

PLACING EXTRACTION PARACHUTE

4-33. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

4-34. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

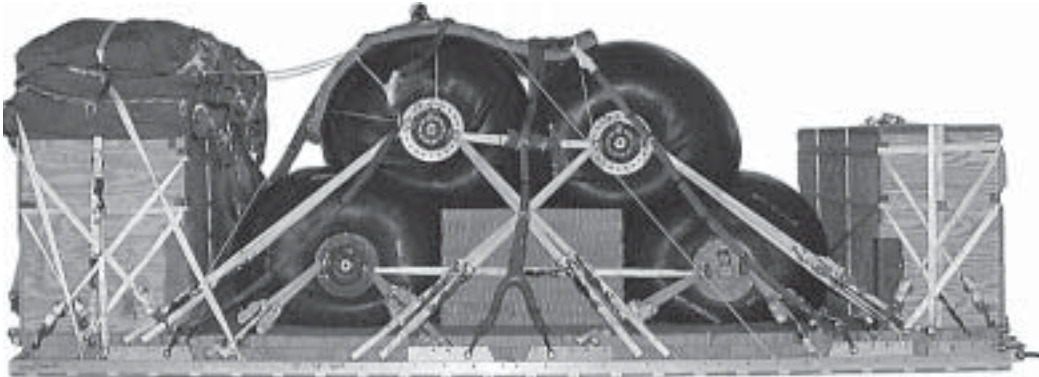
4-35. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-54. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

4-36. Use the equipment list in Table 4-3 to rig the load shown in Figure 4-54.

CAUTION

Make the final inspection required by FM 4-20.102/NAVSEA
SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves
the rigging site.



CB

RIGGED LOAD DATA

Weight 22,630 pounds

NOTE: The rigged weight for this load is using water as the liquid. Use the weight
conversion table for the actual rigged weight for any other liquids used.

NOTE: The G-11 requirements may need to be recomputed for lighter liquids.

Maximum Weight 24,000 pounds

Height 88 inches

Width 108 inches

Overall Length 258 inches

Overhang: Front 0 inches

Rear (EFTC) 18 inches

Center of Balance (CB) (from front edge of platform) 121 inches

Figure 4-54. AAFARS Rigged with Four 500-Gallon Drums for Low-Velocity Airdrop

Table 4-3. Equipment Required for Rigging AAFARS with Four Drums on 20-foot Type V Platform

Table 4-3. Equipment Required for Rigging AAFARS with Four Drums on 20-foot Type V Platform (continued)

National Stock Number	Item	Quantity
1670-01-307-1055	Link assembly: Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17	1
5510-00-220-6146	Lumber: 2- by 4-in	As required
5510-00-220-6148	2- by 6-in	As required
5315-00-010-4659	Nail, steel wire, common, 8d	As required
5315-00-010-4662	12d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	25 sheets
1670-01-016-7841	Parachute: Cargo: G-11C	5
1670-00-040-8135	Cargo extraction: 28-foot	1
1670-01-063-3715	Drogue: (for DES) 15-ft	1
1670-01-353-8425	Platform, airdrop, Type V, 20-foot	1
1670-01-162-2376	Bracket assembly, EFTC	1
1670-01-162-2372	Bracket assembly, extraction	62
1670-01-247-2389	Clevis assembly	8
1670-01-162-2381	Bracket, suspension	2
5530-00-128-4981	Tandem link assembly (multipurpose link)	11 sheets
1670-01-097-8817	Plywood, 3/4-in	1
1670-01-062-6306	Release, cargo parachute, M-2	4
1670-01-062-6307	Sling, cargo, airdrop	2
1670-01-062-6308	For suspension: 3-ft (4-loop), type XXVI nylon webbing	2
1670-01-064-4453	12-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6304	16-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6311	20-ft (4-loop), type XXVI nylon webbing	1
5340-00-040-8219	For deployment: 9-ft (2-loop), type XXVI nylon webbing	5
7510-00-266-5016	For riser extension: 120-ft (2-loop), type XXVI	2
7510-00-266-6710	Strap, parachute release, multicut, comes w/ 3 knives	As required
1670-00-937-0271	Tape, adhesive, 2-in	As required
8305-00-268-2411	Tape, masking, 2-in	62
8305-00-082-5752	Tie-down assembly, 15-foot	As required
8305-00-263-3591	Webbing: Cotton, 1/4-in, type I	As required
	Nylon, tubular, 1/2-in	As required
	Type VIII	As required

SECTION III- RIGGING AAFARS WITH FIVE 500-GALLON FUEL DRUM

DESCRIPTION OF LOAD

4-37. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 24-foot type, V platform with six G-11 cargo parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum of 55 GPM. There are five collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The total rigged overall length is 288 inches. Width is 108 inches. Height is 96 inches. Center of balance is 146 inches.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

4-38. Prepare a 24-foot type V airdrop platform using two tandem links, eight suspension brackets, and 80 tie-down clevises as shown in Figure 4-55.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

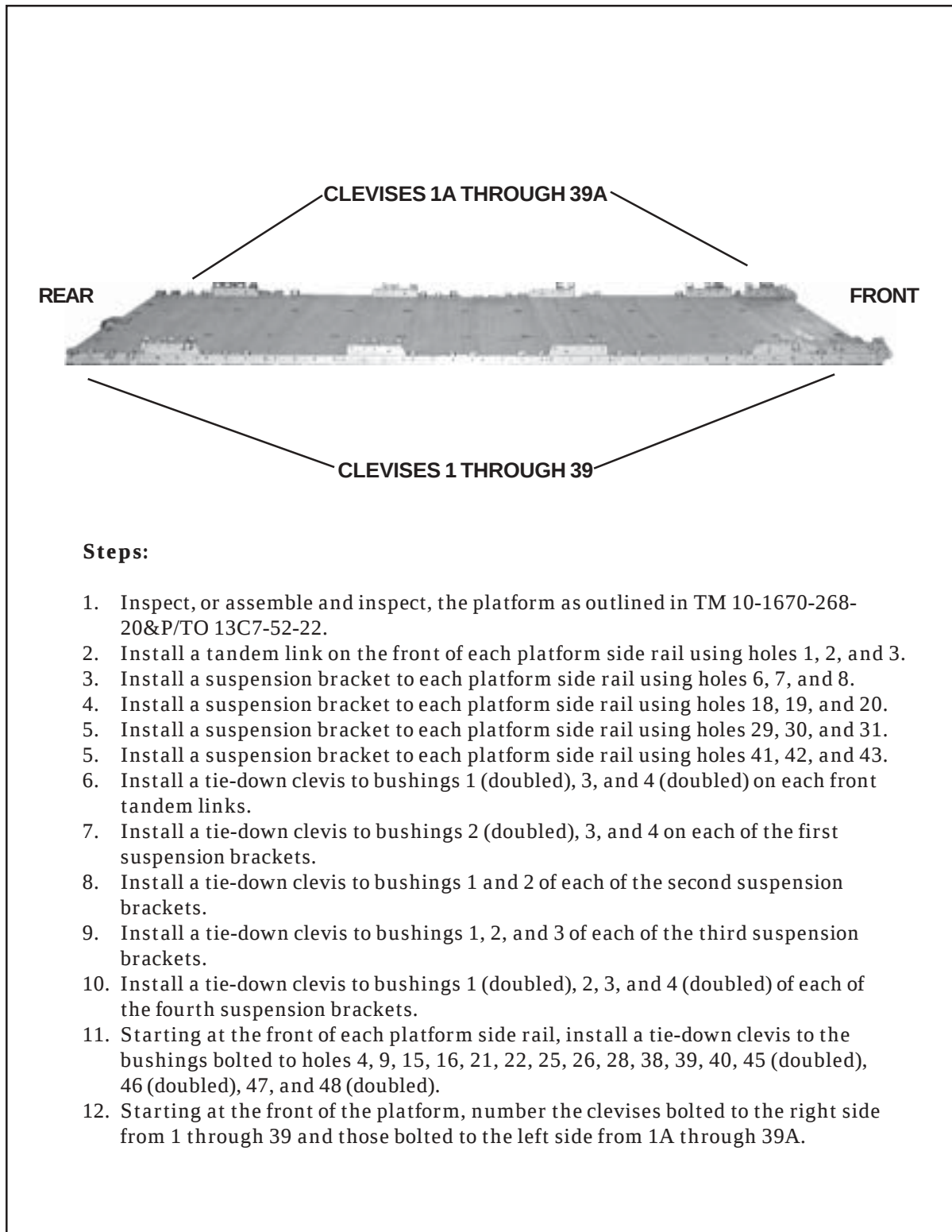


Figure 4-55. Platform Prepared

PREPARING HONEYCOMB

4-39. Build honeycomb stacks as shown in Figures 4-56 and 4-57.

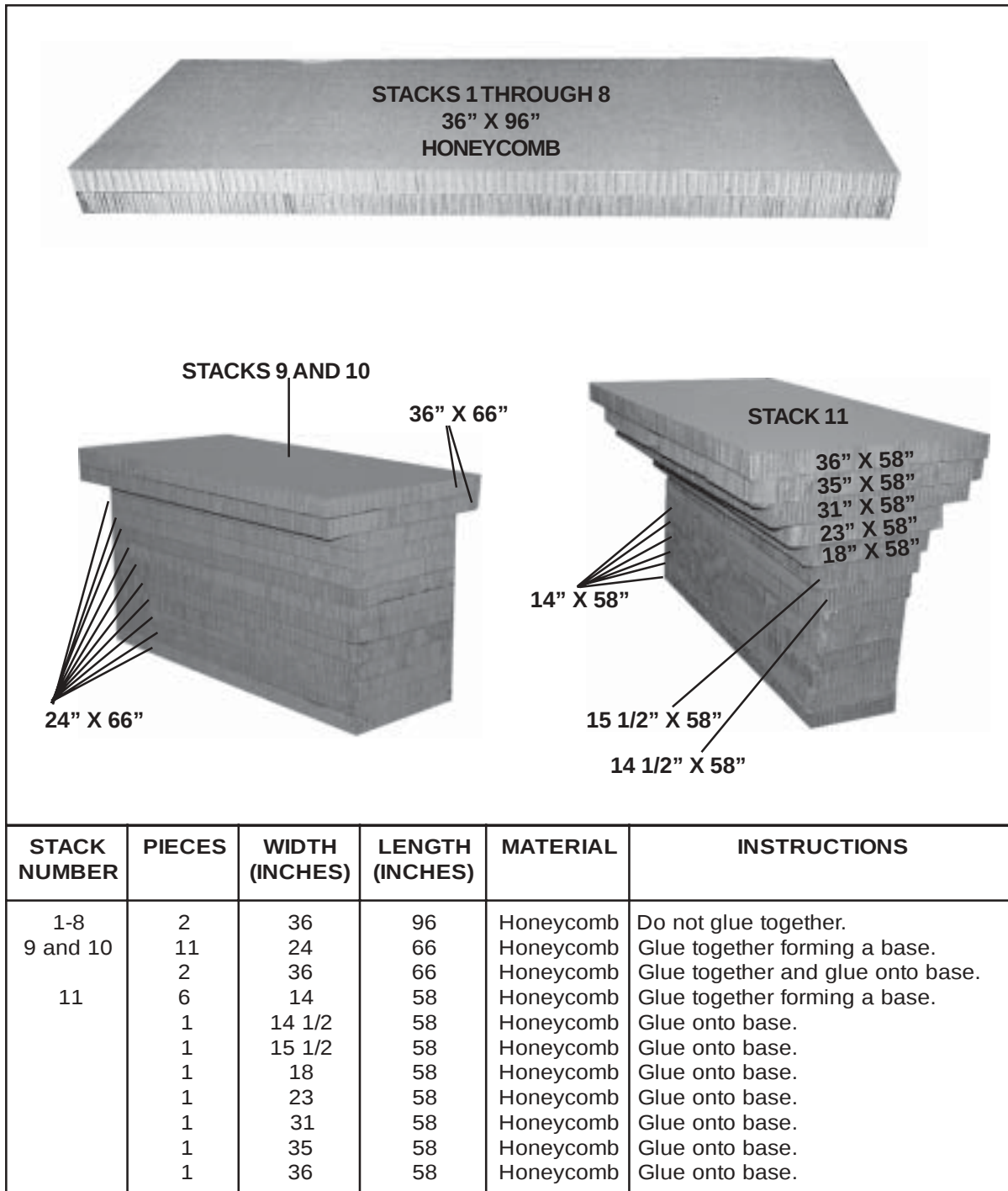


Figure 4-56. Honeycomb Stacks Prepared

POSITIONING HONEYCOMB STACKS

4-40. Position honeycomb stacks as shown in Figure 4-57.

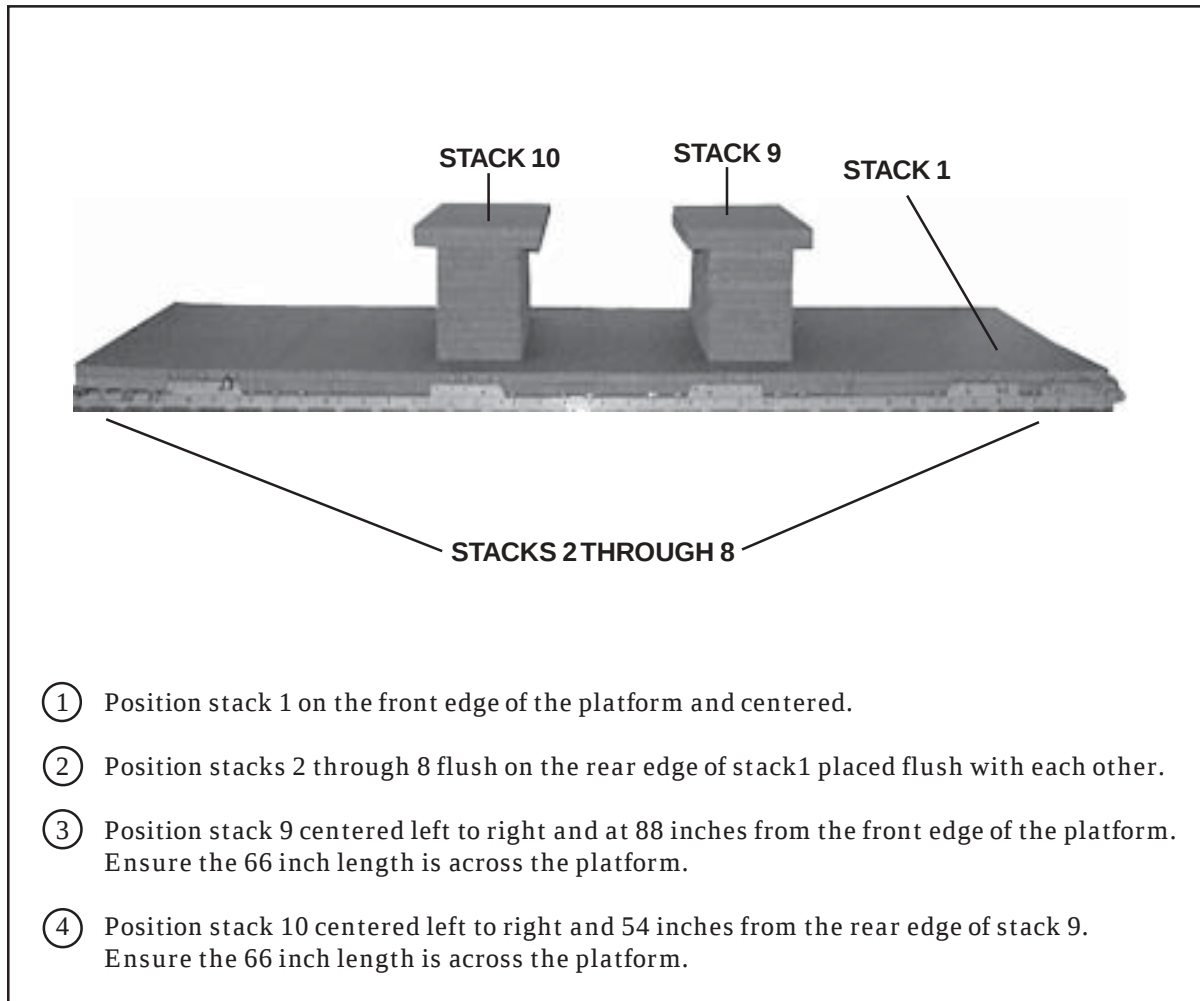


Figure 4-57. Positioning Honeycomb Stacks

BUILDING THE EQUIPMENT BOXES

4-41. Build the front and rear equipment boxes as shown in Figures 4-4 and 4-5.

PREPARING EQUIPMENT FOR EQUIPMENT BOXES

4-42. Prepare the fire extinguishers, filter separator, explosion proof motor, pumps, battery box, manuals and toolkit as explained and shown in paragraph 4-6 and Figures 4-6 through 4-12. Using the list printed on the equipment bags, place the equipment indicated on each list into it's bag.

POSITIONING EQUIPMENT BOXES

4-43. Pre-position lashings described and shown in Figure 4-13, steps 1 through 3. Place the boxes over the lashings and flush with the edges of the honeycomb as described and shown in Figure 4-13, steps 4 and 5.

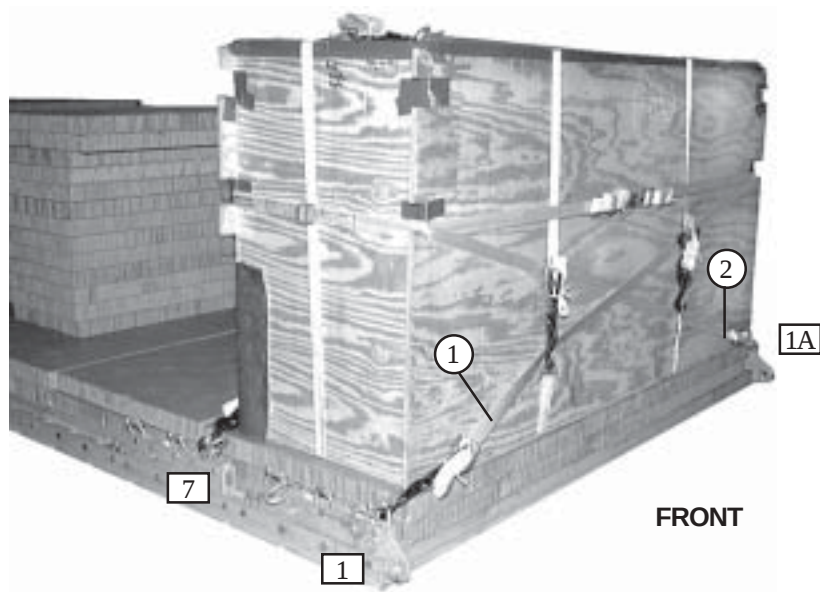
POSITIONING EQUIPMENT IN EQUIPMENT BOXES AND SECURING BOXES

4-44. Position and secure equipment in equipment boxes as shown in Figures 4-14 and 4-15.

LASHING THE EQUIPMENT BOXES TO THE PLATFORM

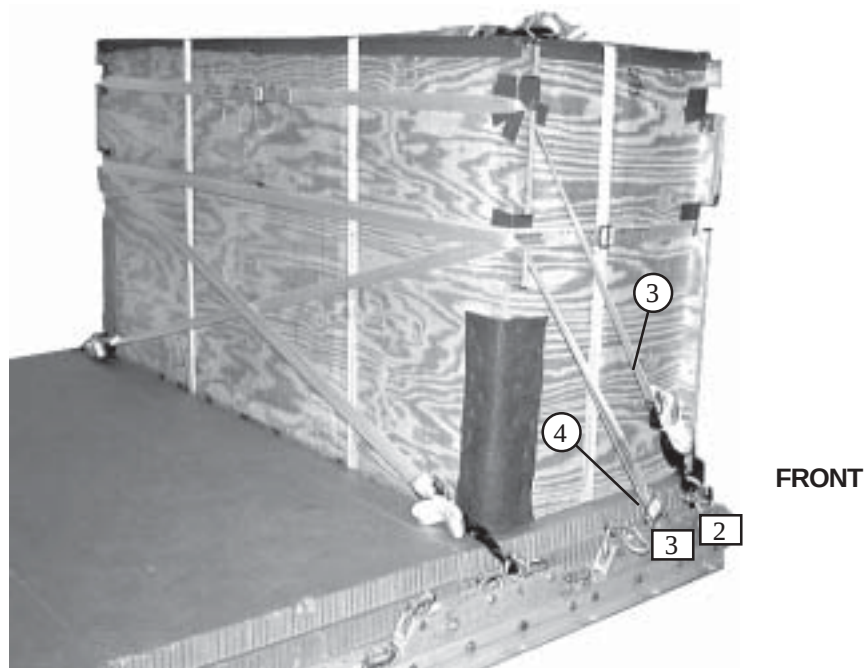
4-45. Lash the equipment boxes as shown in Figures 4-58 through 4-63.

- a.** Lash the front equipment box to the platform as shown in Figures 4-58 through 4-60.



Lashing Number	Tie-down Clevis Number	Instructions
1	1 and 7	Route a 30-foot lashing from clevis 1 to the front bottom left cutout, to the rear bottom left cutout, to clevis 7.
2	1A and 7A	Route a 30-foot lashing from clevis 1A to the front bottom right cutout, to the rear bottom right cutout, to clevis 7A.

Figure 4-58. Lashings 1 and 2 Installed



Lashing Number	Tie-down Clevis Number	Instructions
3	2 and 2A	Route a 30-foot lashing from clevis 2 to the rear top right cutout, to the rear top left cutout, to clevis 2A.
4	3 and 3A	Route a lashing through it's own D-ring on clevis 3 to the rear bottom right cutout, to the rear bottom left cutout, to clevis 3A.

Figure 4-59. Lashings 3 and 4 Installed

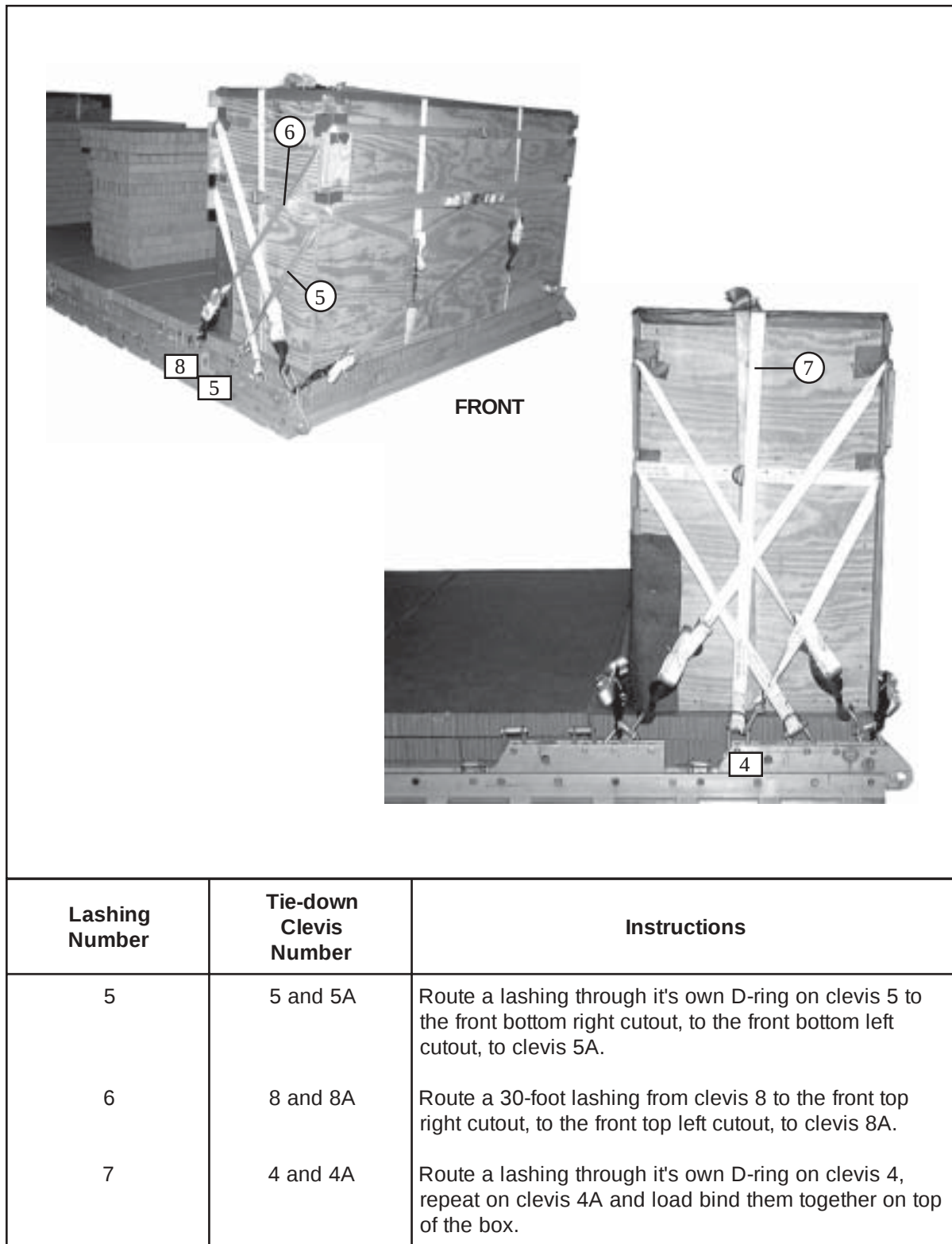


Figure 4-60. Lashings 5 through 7 Installed

b. Lash the rear equipment box to the platform as shown in Figures 4-61 through 4-63.

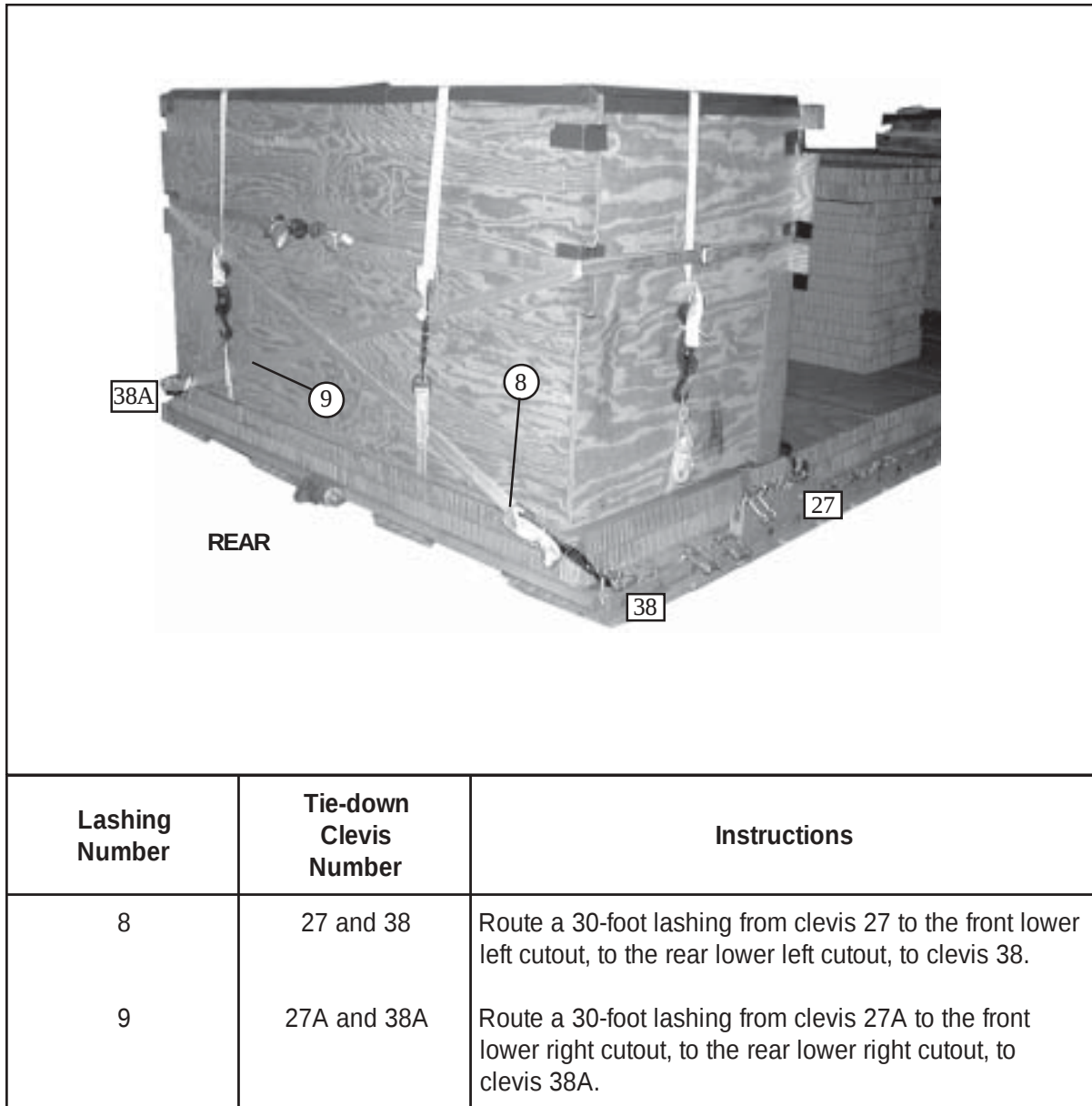
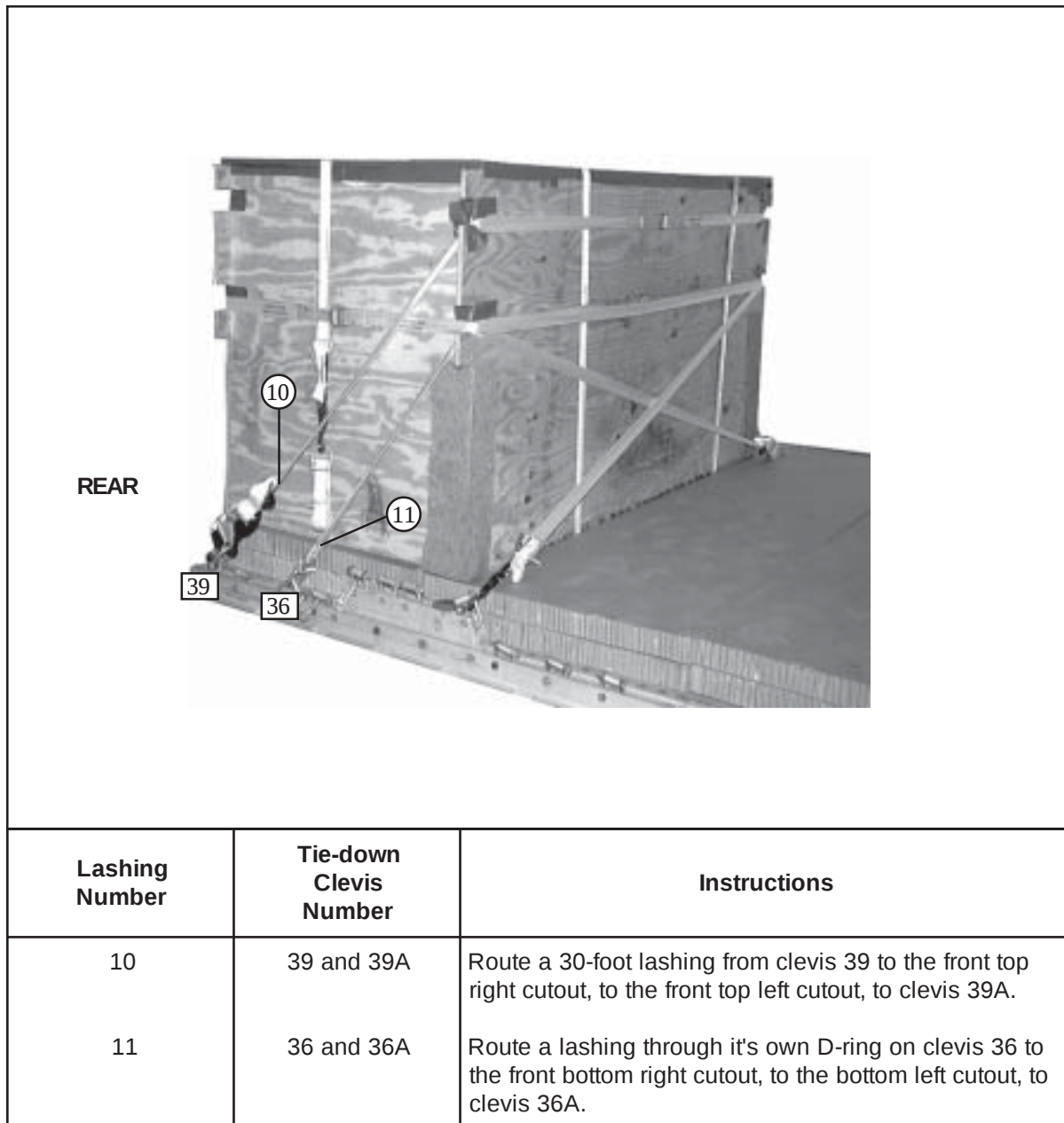


Figure 4-61. Lashings 8 and 9 Installed

**Figure 4-62. Lashings 10 and 11 Installed**

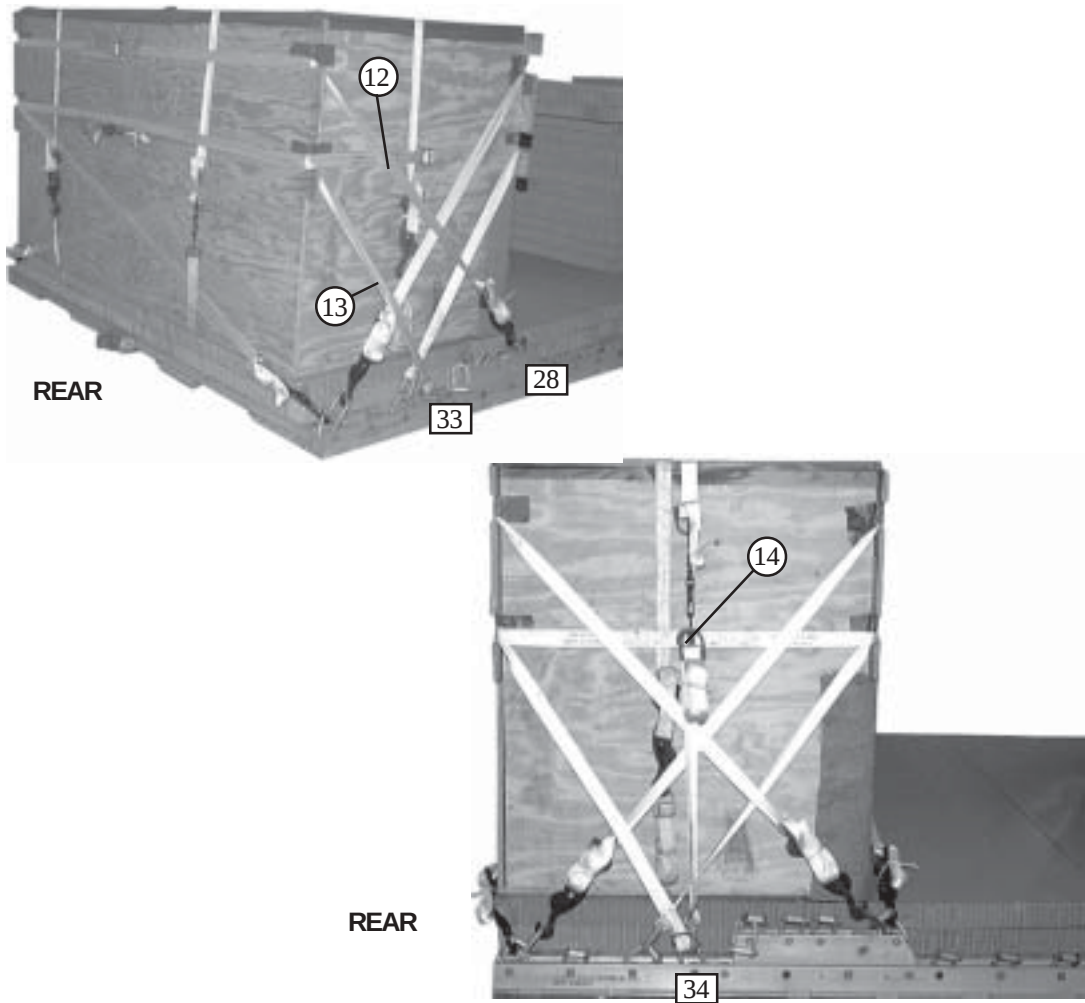
		
Lashing Number	Tie-down Clevis Number	Instructions
12	28 and 28A	Route a 30-foot lashing from clevis 28 to the rear top right cutout, to the rear top left cutout, to clevis 28A.
13	33 and 33A	Route a lashing through it's own D-ring on clevis 33 to the rear bottom right cutout, to the rear bottom left cutout, to clevis 33A.
14	34 and 34A	Route a lashing through it's own D-ring on clevis 34, repeat on clevis 34A and load bind on the right side of the box .

Figure 4-63. Lashings 12 through 14 Installed

POSITIONING AND LASHING THE DRUMS

4-46. Position and lash the drums to the platform as shown in Figures 4-64 through 4-71.

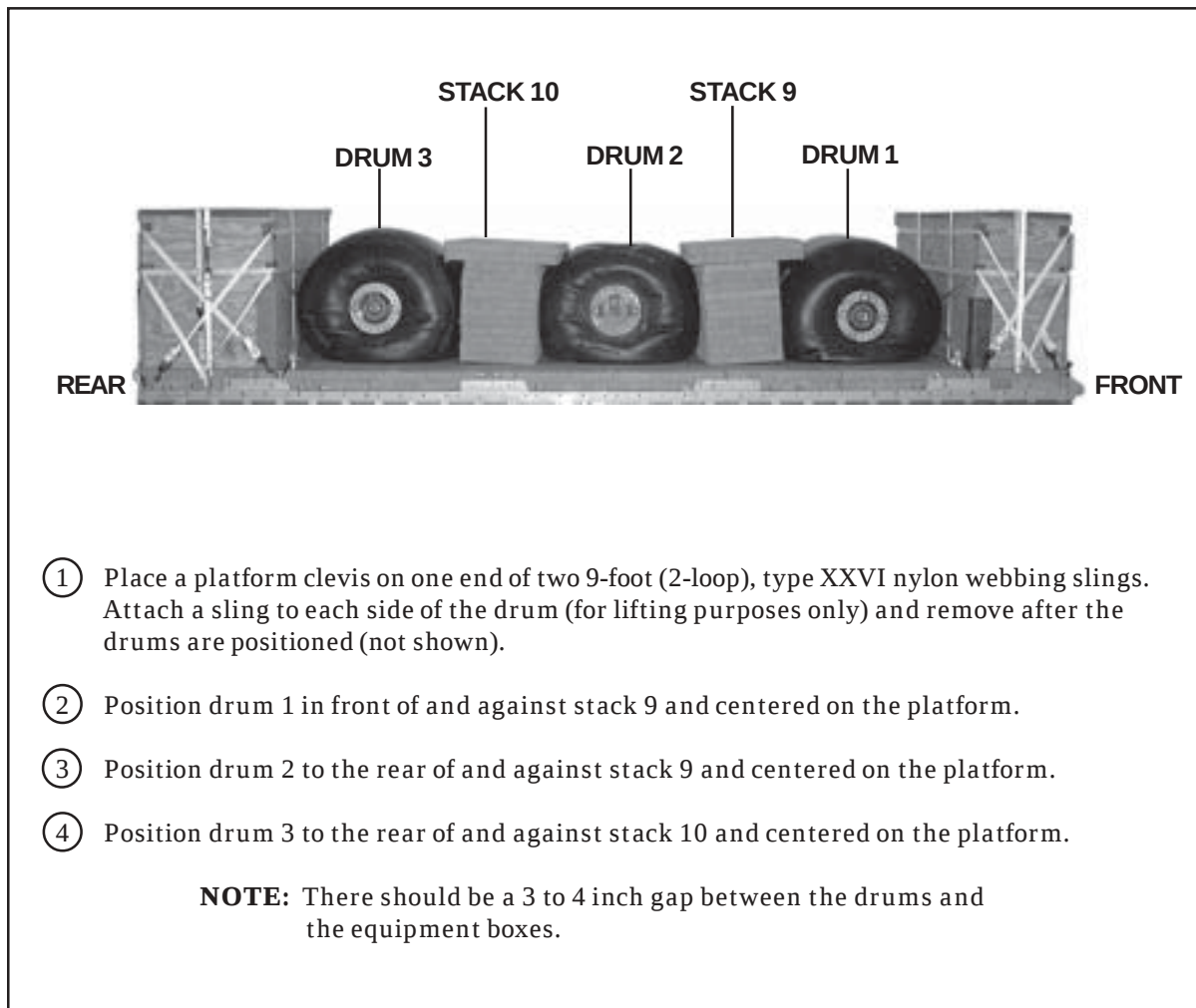


Figure 4-64. Fuel Drums 1 through 3 Positioned

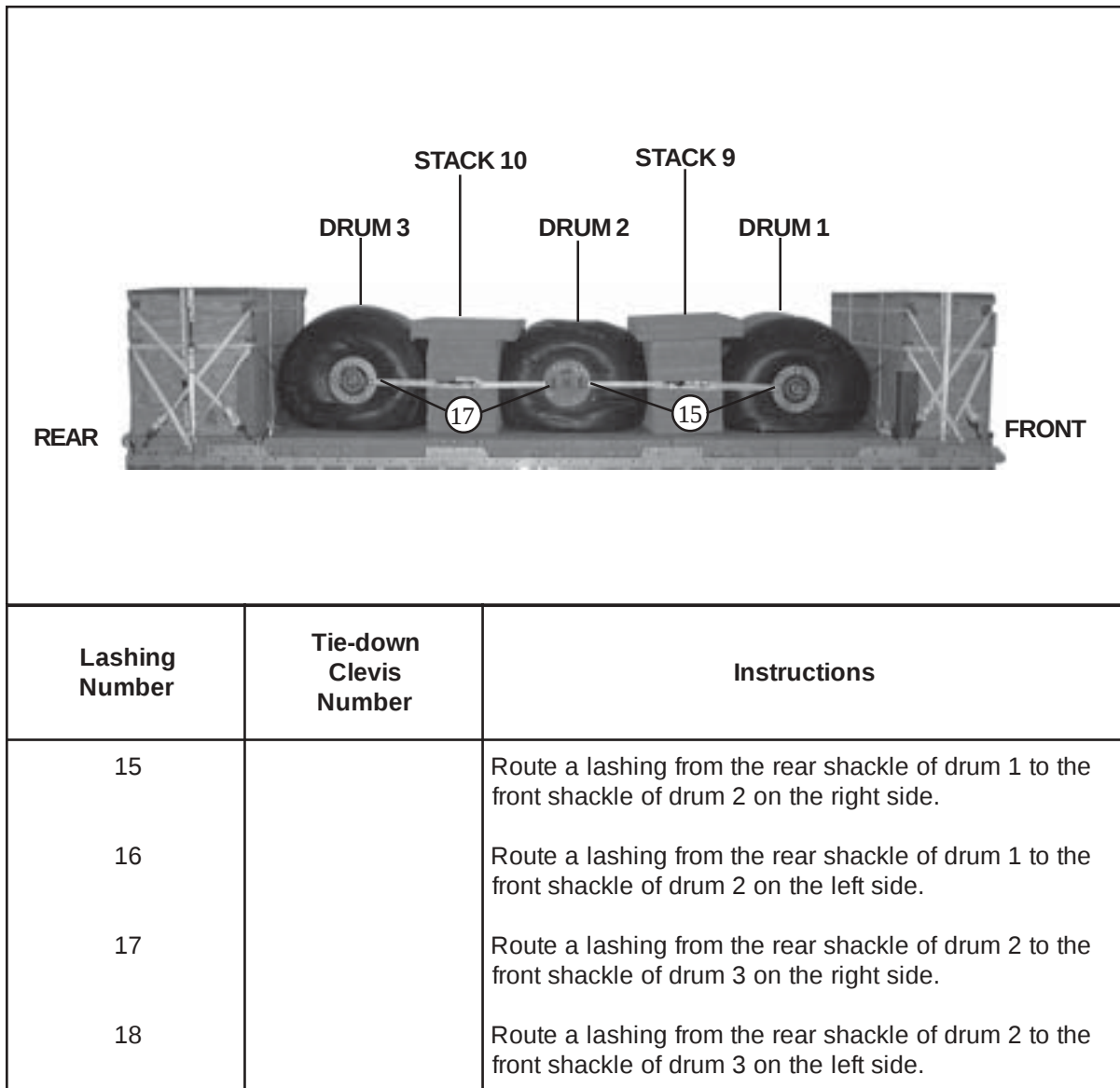


Figure 4-65. Lashings 15 through 18 Installed

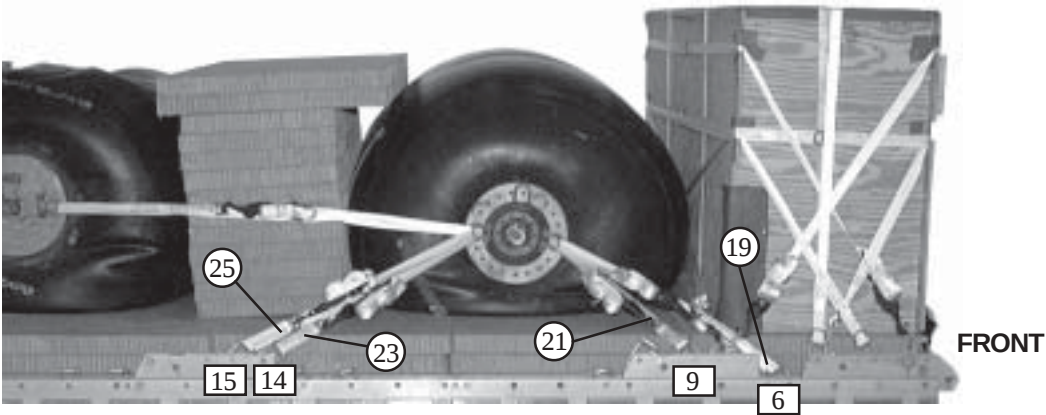
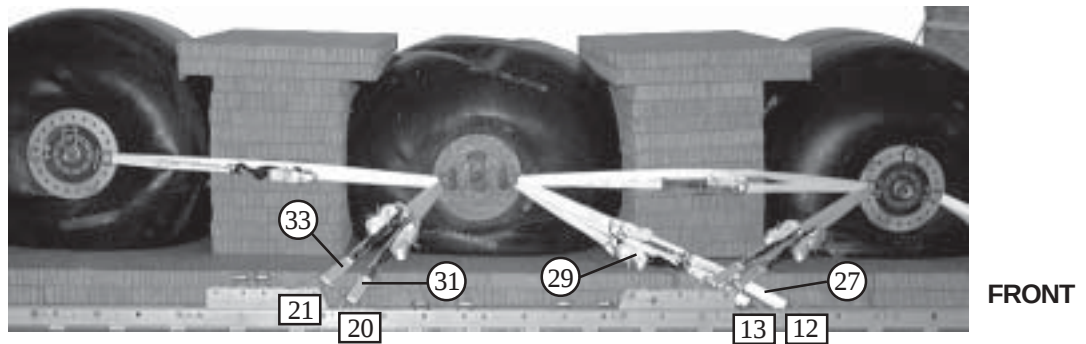
		
Lashing Number	Tie-down Clevis Number	Instructions
19	6	Route a lashing from clevis 6 to the front right shackle on drum 1.
20	6A	Route a lashing from clevis 6A to the front left shackle on drum 1.
21	9	Route a lashing from clevis 9 to the front right shackle on drum 1.
22	9A	Route a lashing from clevis 9A to the front left shackle on drum 1.
23	14	Route a lashing from clevis 14 to the rear right shackle on drum 1.
24	14A	Route a lashing from clevis 14A to the rear left shackle on drum 1.
25	15	Route a lashing from clevis 15 to the rear right shackle on drum 1.
26	15A	Route a lashing from clevis 15A to the rear left shackle on drum 1.

Figure 4-66. Lashings 19 through 26 Installed



Lashing Number	Tie-down Clevis Number	Instructions
27	12	Route a lashing from clevis 12 to the front right shackle on drum 2.
28	12A	Route a lashing from clevis 12A to the front left shackle on drum 2.
29	13	Route a lashing from clevis 13 to the front right shackle on drum 2.
30	13A	Route a lashing from clevis 13A to the front left shackle on drum 2.
31	20	Route a lashing from clevis 20 to the rear right shackle on drum 2.
32	20A	Route a lashing from clevis 20A to the rear left shackle on drum 2.
33	21	Route a lashing from clevis 21 to the rear right shackle on drum 2.
34	21A	Route a lashing from clevis 21A to the rear left shackle on drum 2.

Figure 4-67. Lashings 27 through 34 Installed

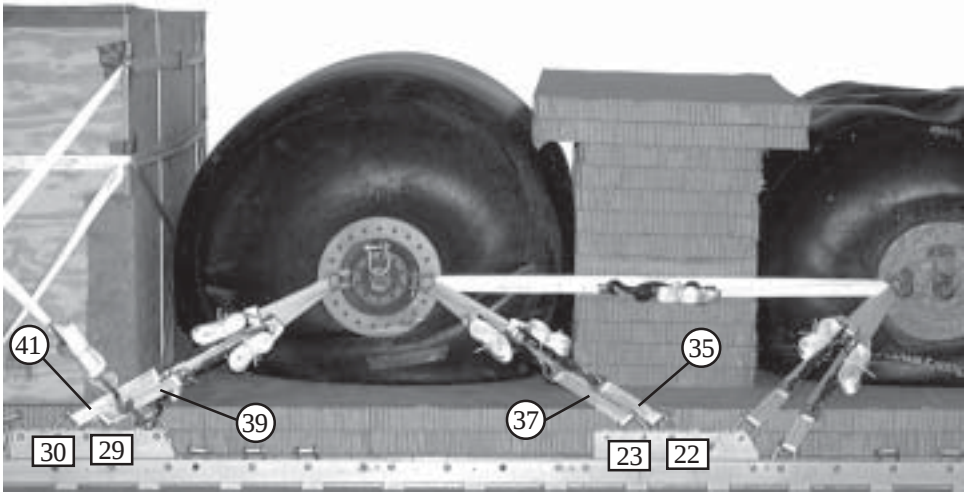
		
Lashing Number	Tie-down Clevis Number	Instructions
35	22	Route a lashing from clevis 22 to the front right shackle on drum 3.
36	22A	Route a lashing from clevis 22A to the front left shackle on drum 3.
37	23	Route a lashing from clevis 23 to the front right shackle on drum 3.
38	23A	Route a lashing from clevis 23A to the front left shackle on drum 3.
39	29	Route a lashing from clevis 29 to the rear right shackle on drum 3.
40	29A	Route a lashing from clevis 29A to the rear left shackle on drum 3.
41	30	Route a lashing from clevis 30 to the rear right shackle on drum 3.
42	30A	Route a lashing from clevis 30A to the rear left shackle on drum 3.

Figure 4-68. Lashings 35 through 42 Installed

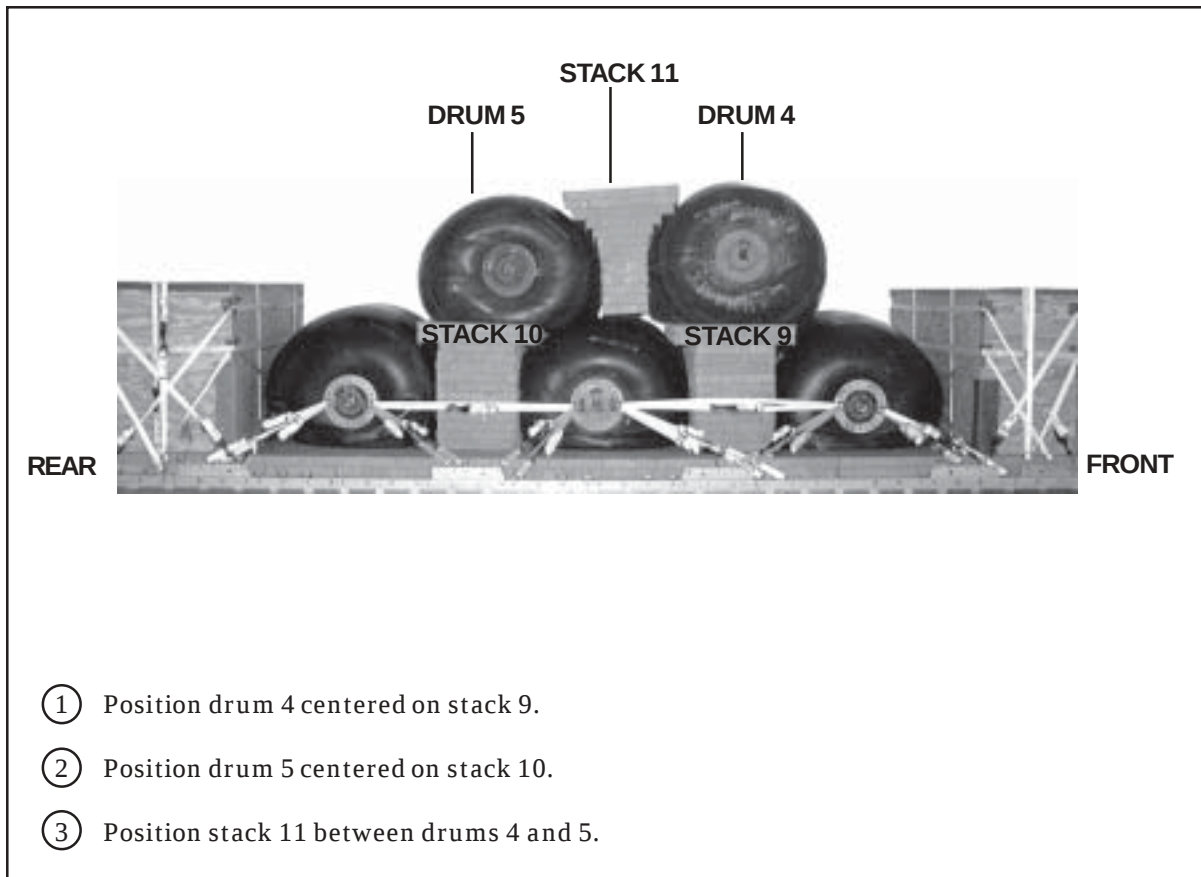


Figure 4-69. Fuel Drums 4 and 5 Positioned

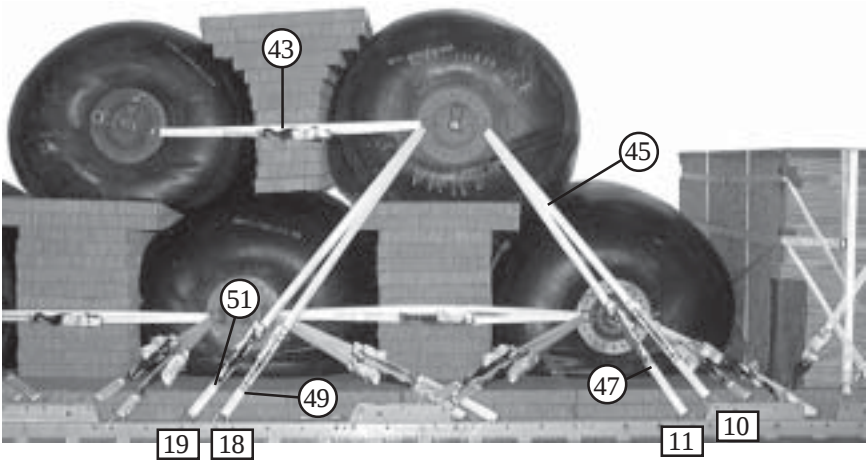
		
Lashing Number	Tie-down Clevis Number	Instructions
43		Route a lashing from the rear shackle of drum 4 to the front shackle of drum 5 on the right side.
44		Route a lashing from the rear shackle of drum 4 to the front shackle of drum 5 on the left side.
45	10	Route a lashing from clevis 10 to the front right shackle on drum 4.
46	10A	Route a lashing from clevis 10A to the front left shackle on drum 4.
47	11	Route a lashing from clevis 11 to the front right shackle on drum 4.
48	11A	Route a lashing from clevis 11A to the front left shackle on drum 4.
49	18	Route a lashing from clevis 18 to the rear right shackle on drum 4.
50	18A	Route a lashing from clevis 18A to the rear left shackle on drum 4.
51	19	Route a lashing from clevis 19 to the rear right shackle on drum 4.
52	19A	Route a lashing from clevis 19A to the rear left shackle on drum 4.

Figure 4-70. Lashings 43 through 52 Installed

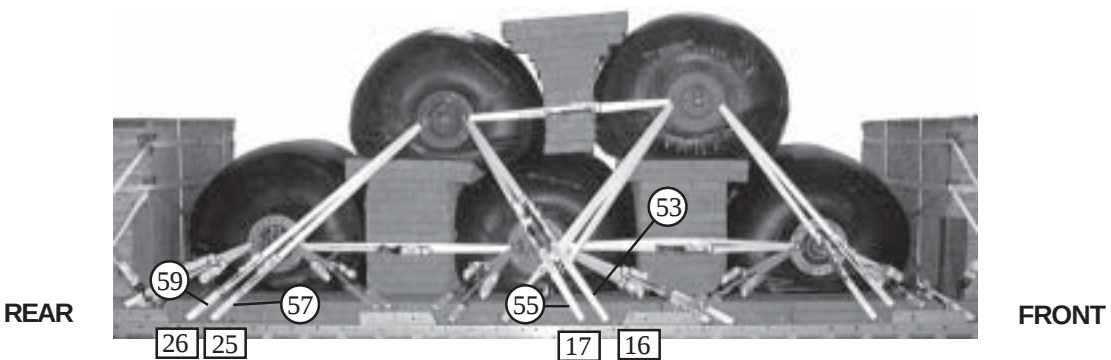
 REAR FRONT		
NOTE: Wrap the load binder between drums 4 and 5 with a 1/2-inch- by 12-inch- by 17-inch piece of felt and secure it with type III nylon cord (not shown).		
Lashing Number	Tie-down Clevis Number	Instructions
53	16	Route a lashing from clevis 16 to the front right shackle on drum 5.
54	16A	Route a lashing from clevis 16A to the front left shackle on drum 5.
55	17	Route a lashing from clevis 17 to the front right shackle on drum 5.
56	17A	Route a lashing from clevis 17A to the front left shackle on drum 5.
57	25	Route a lashing from clevis 25 to the rear right shackle on drum 5.
58	25A	Route a lashing from clevis 25A to the rear left shackle on drum 5.
59	26	Route a lashing from clevis 26 to the rear right shackle on drum 5.
60	26A	Route a lashing from clevis 26A to the rear left shackle on drum 5.

Figure 4-71. Lashings 53 through 60 Installed

BUILDING AND POSITIONING RELEASE PLATFORM

4-47. Build and position the release platform as shown in Figure 4-72.

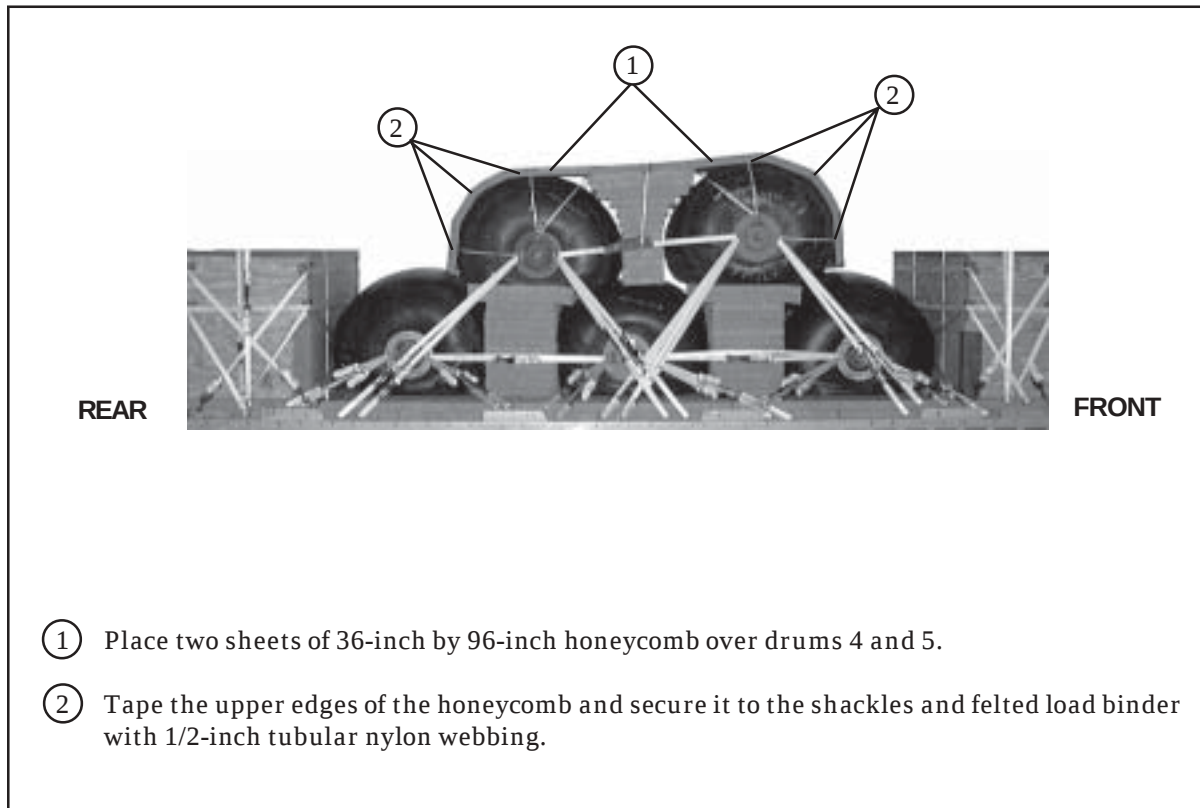


Figure 4-72. Release Platform Built and Positioned

INSTALLING SUSPENSION SLINGS AND SAFETY TIES

4-48. Install suspension slings and safety ties as shown in Figure 4-73.

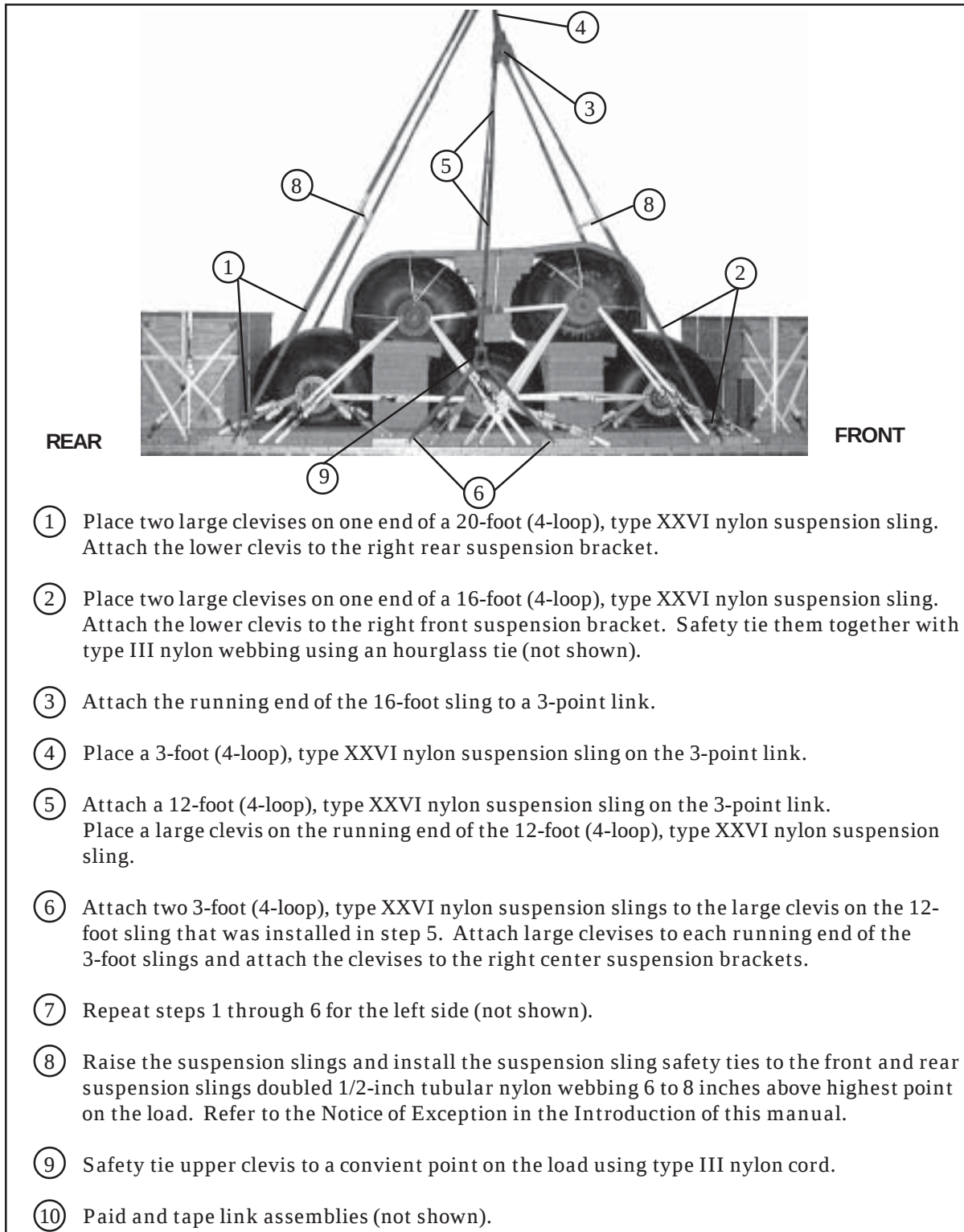


Figure 4-73. Suspension Slings and Safety Ties Installed

PREPARING AND STOWING CARGO PARACHUTES

4-49. Prepare and stow six G-11 cargo parachute as shown in Figure 4-74.

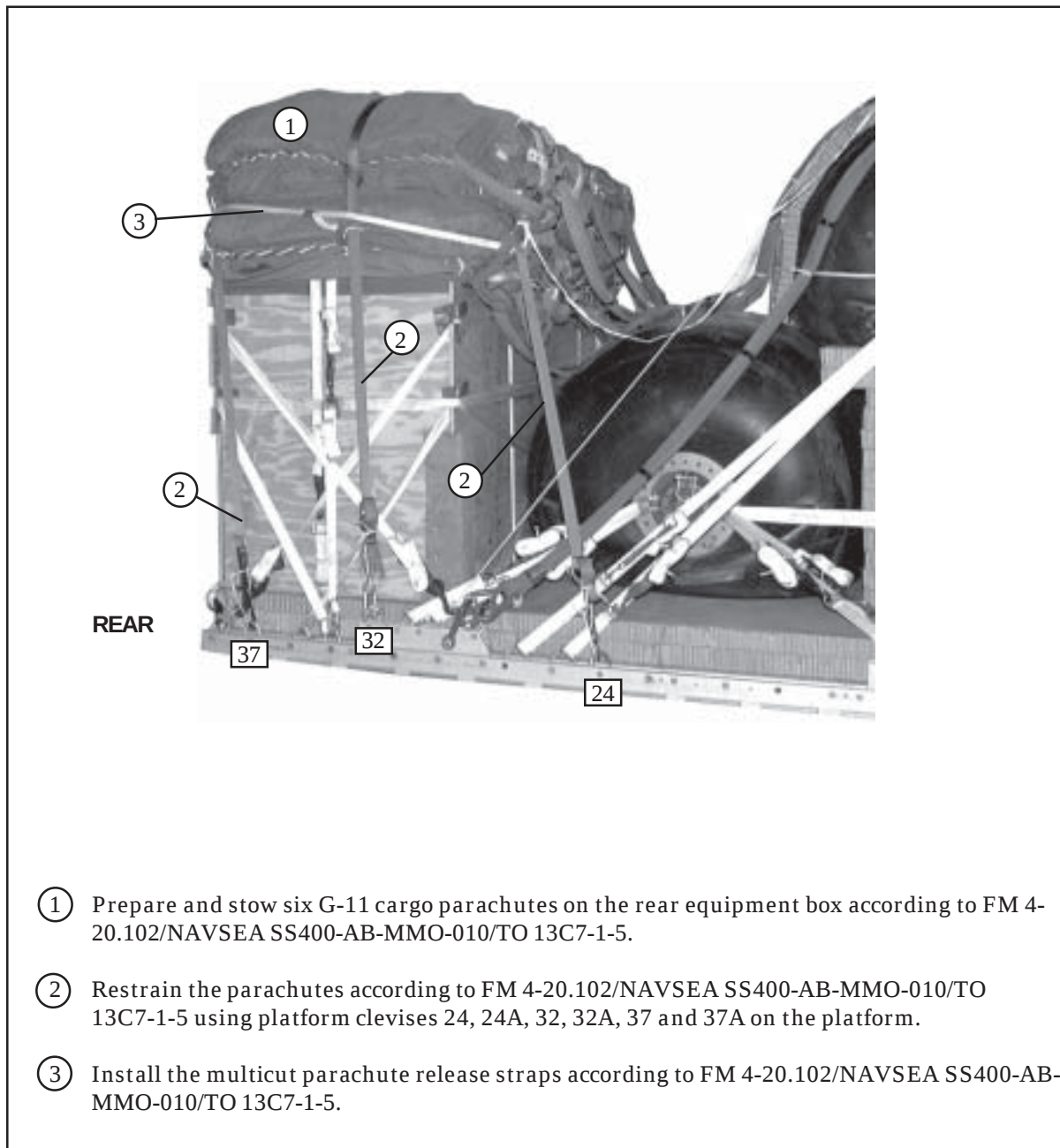


Figure 4-74. Cargo Parachutes Prepared and Stowed

INSTALLING THE EXTRACTION SYSTEM

4-50. Install the extraction system as shown in Figure 4-75.

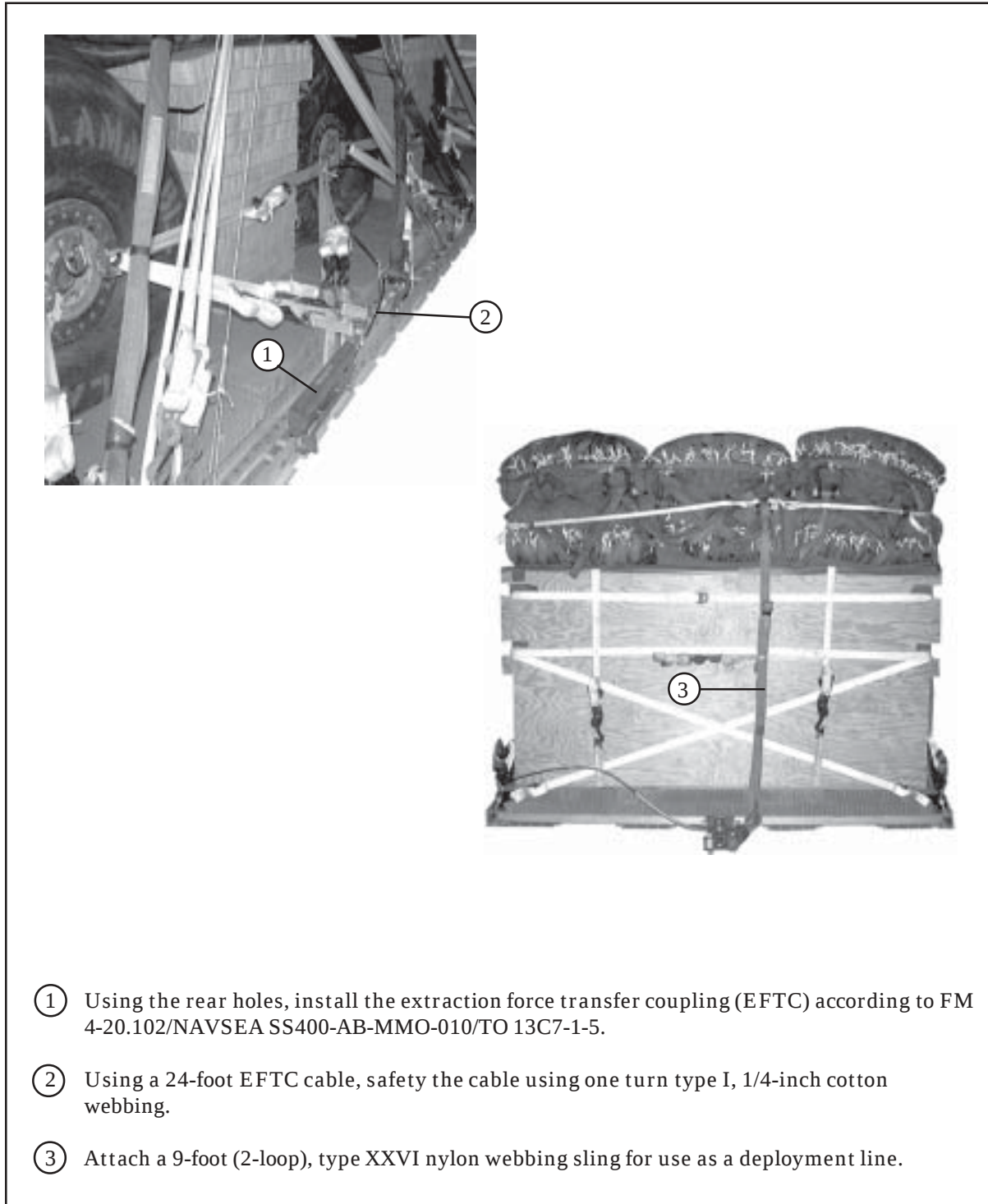
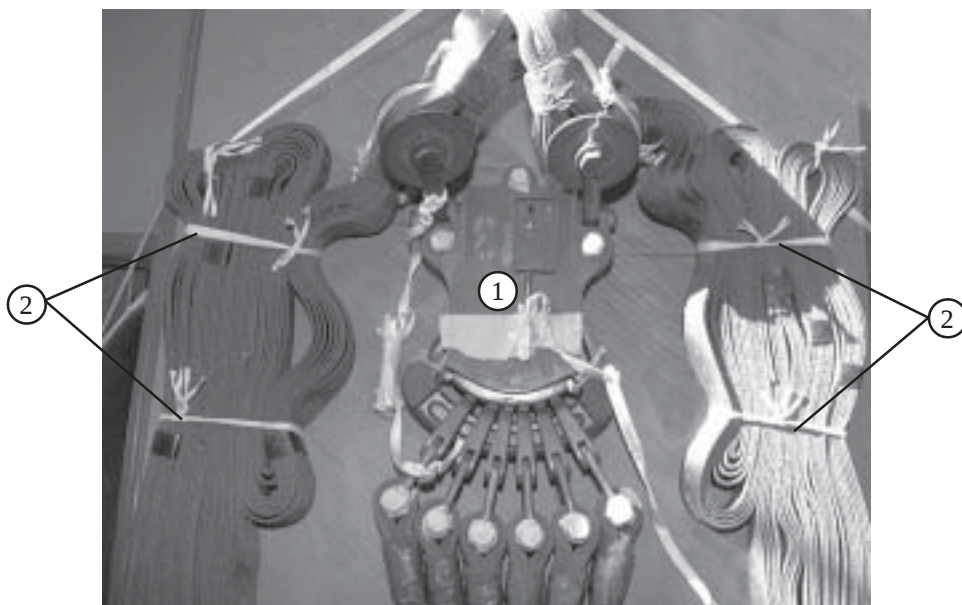


Figure 4-75. Extraction System Installed

INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-51. Install the M-2 cargo parachute release system as shown in Figure 4-76.



- ① Place the M-2 release on the release platform. Attach the suspension slings and the parachute riser extensions to the M-2 cargo release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.
- ② S-fold and tie any slack in the suspension slings with type I, 1/4-inch cotton webbing.

Figure 4-76. Cargo Parachute Release Installed

PLACING EXTRACTION PARACHUTE

4-52. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-268-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

4-53. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

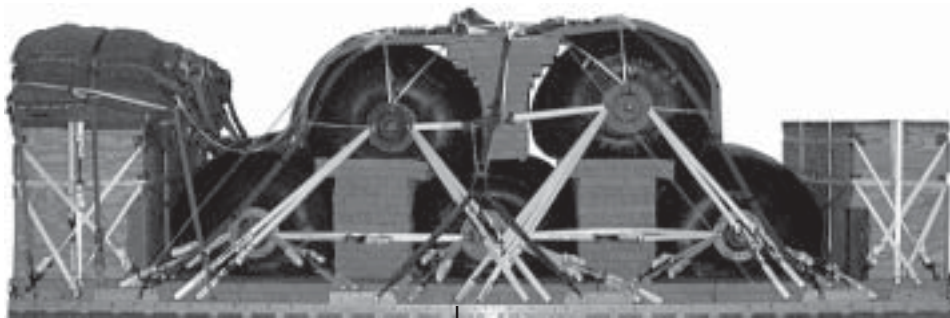
4-54. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-77. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

4-55. Use the equipment list in Table 4-4 to rig the load shown in Figure 4-77.

CAUTION

Make the final inspection required by FM 4-20.102/
NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before
the load leaves the rigging site.



CB

RIGGED LOAD DATA

Weight	27,292 pounds
Maximum Weight	30,000 pounds
Height	96 inches
Width	108 inches
Overall Length	306 inches
Overhang: Front	0 inches
Overhang: Rear (EFTC)	18 inches
Center of Balance (CB) (from front edge of platform)	146 inches

Figure 4-77. AAFARS With Five 500-Gallon Drums Rigged for Low Velocity Airdrop

Table 4-4. Equipment Required for Rigging AAFARS with Five 500-Gallon Drums

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	20
4030-00-678-8562	Clevis, medium	6
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5783	Coupling, airdrop, extraction force transfer with cable, 24-ft	1
1670-00-360-0328	Cover, clevis, large	6
8305-00-958-3685	Felt sheet, 1/2-inch	As required
1670-01-183-2678	Leaf, extraction line (line bag)	2
1670-01-064-4452	Line, drogue (for DES) 60-foot (1-loop), type XXVI	1
1670-01-062-6313	Line, extraction: For C-130: 60-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-141: 140-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-17: 140-foot (3-loop), type XXVI	1
1670-01-062-6313	For C-5: 60-ft, (3-loop), type XXVI	1
1670-01-107-7651	140-ft, (3-loop), type XXVI	1
	Link assembly:	1
	Two-point, 3 3/4-in	2
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	
	Two-point, 3 3/4-in (for DES)	1
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2
1670-01-307-1055	Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1
	Lumber:	
5510-00-220-6146	2- by 4-in	As required

**Table 4-4. Equipment Required for Rigging AAFARS with Five 500-Gallon Drums
(Continued)**

National Stock Number	Item	Quantity
5315-00-753-3885	Nail, steel wire, common, 16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	32 sheets
1670-01-016-7841	Parachute: Cargo, G-11C	6
1670-00-040-8135	Cargo, extraction, 28ft	1
1670-01-063-3715	Drogue, 15ft (for DES)	1
1670-01-353-8425	Platform, airdrop, type V, 24-foot: Bracket assembly, coupling, (EFTC)	(1)
1670-01-247-2389	Bracket, suspension	(8)
1670-01-162-2372	Clevis assembly, type V	(80)
1670-01-353-8424	Extraction bracket assembly	(1)
1670-01-162-2381	Tandem link assembly	(2)
5530-00-618-8073	Plywood, 3/4- by 48- by 96-in	11 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
1670-01-062-6304	Sling, cargo airdrop: For deployment line: 9-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-6306	For suspension: 3-ft (4-loop), type XXVI nylon webbing	6
1670-01-062-6307	12-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6308	16-ft (4-loop), Type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), typeXXVI nylon webbing	2
1670-01-062-6311	For riser extension: 120-ft (2-loop), type XXVI nylon webbing	6
1670-00-040-8219	Strap, parachute release, multicut	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	70
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-260-6890	Type X	As required

SECTION IV- RIGGING AAFARS WITH SIX 500-GALLON FUEL DRUMS

DESCRIPTION OF LOAD

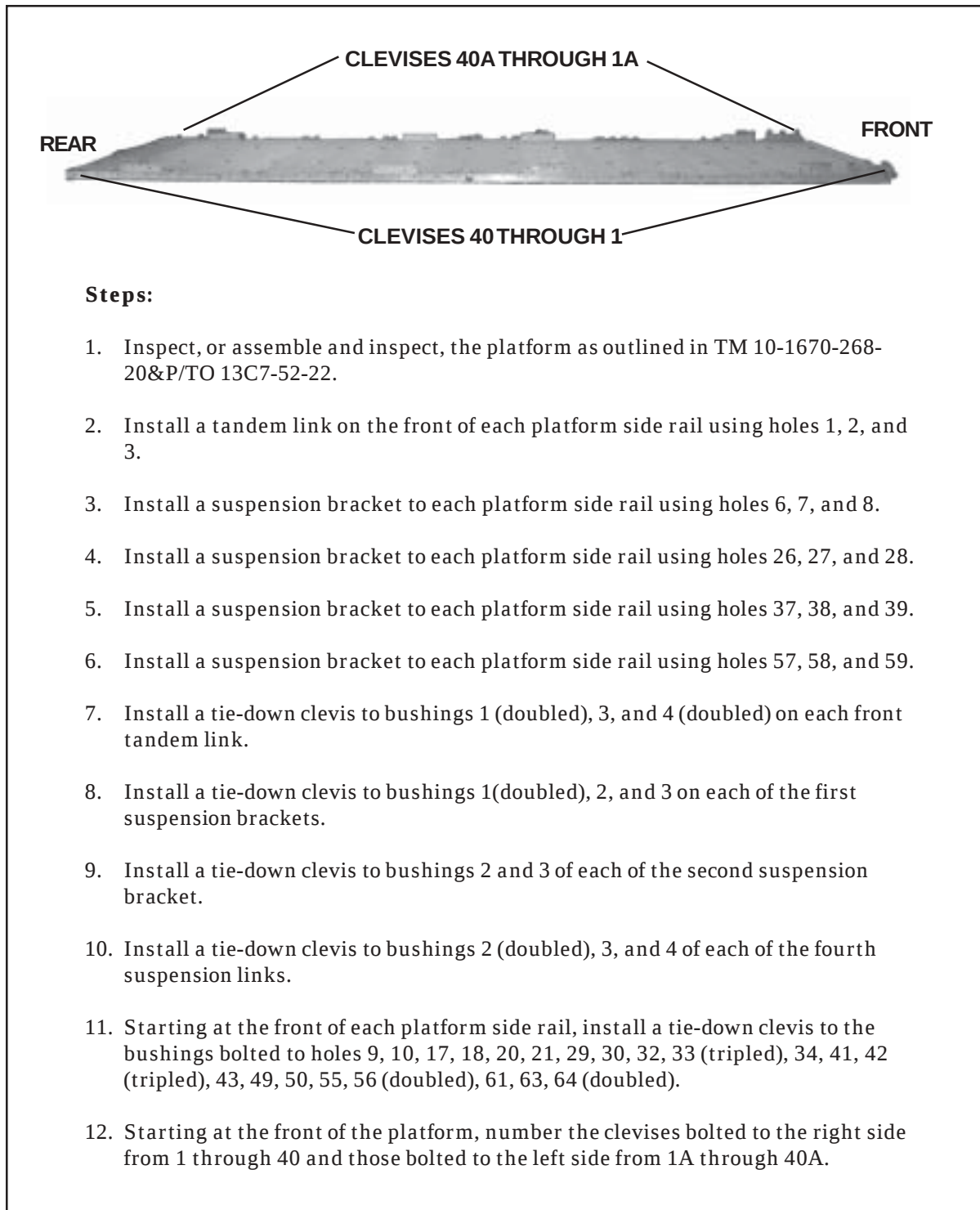
4-56. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 32-foot type, V platform with seven G-11 cargo parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum of 55 GPM. There are six collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The total rigged overall length is 402 inches. Width is 108 inches. Height is 94 inches. Center of balance is 195 inches.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

4-57. Prepare a 32-foot type V airdrop platform using two tandem links, eight suspension brackets and 84 tie-down clevises as shown in Figure 4-78.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

**Figure 4-78. Platform Prepared**

PREPARING HONEYCOMB

4-58. Prepare and build honeycomb stacks as shown in Figure 4-79.

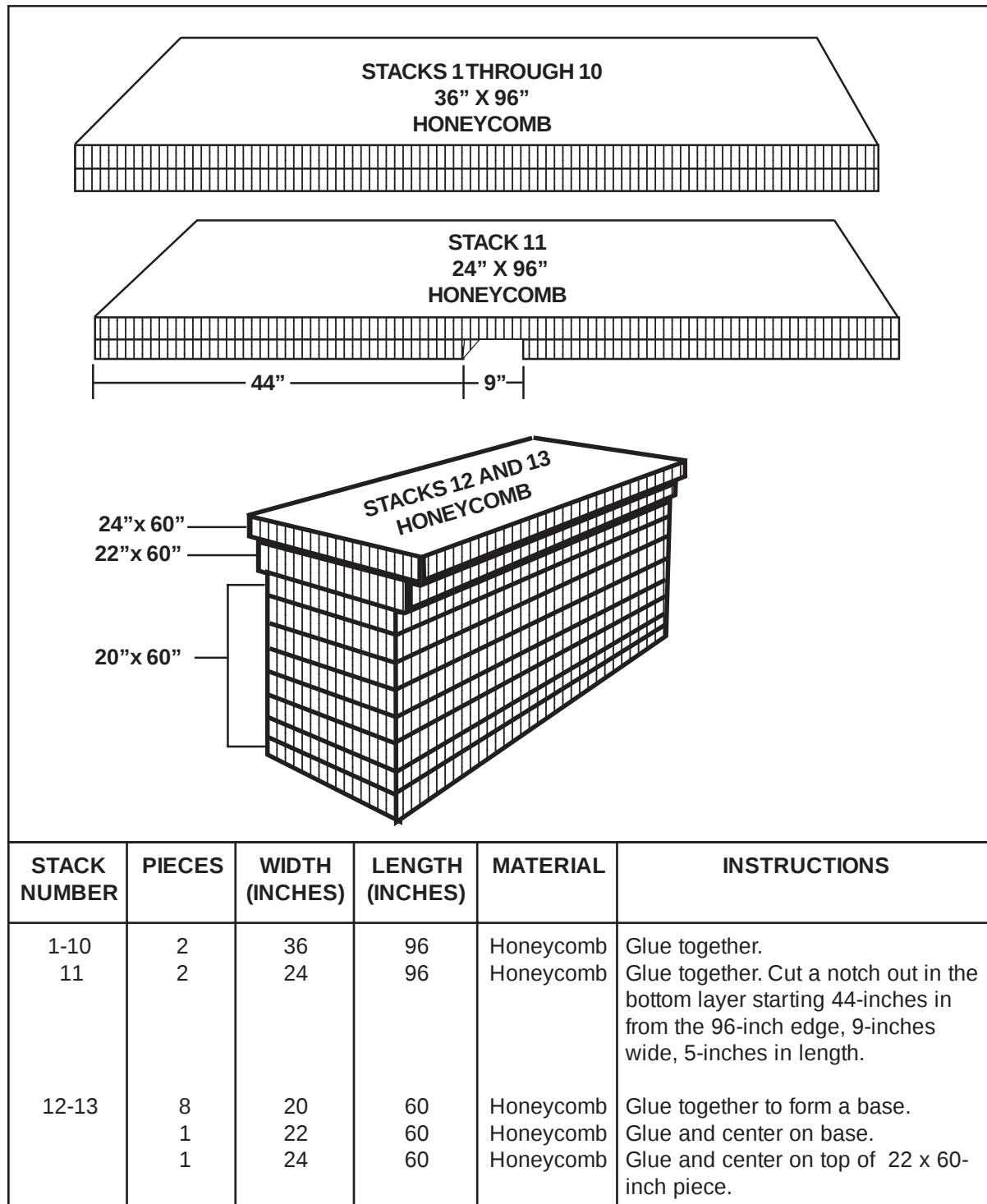


Figure 4-79. Honeycomb Stacks Prepared

POSITIONING HONEYCOMB STACKS

4-59. Position honeycomb stacks 1 through 11 as shown in Figure 4-80.

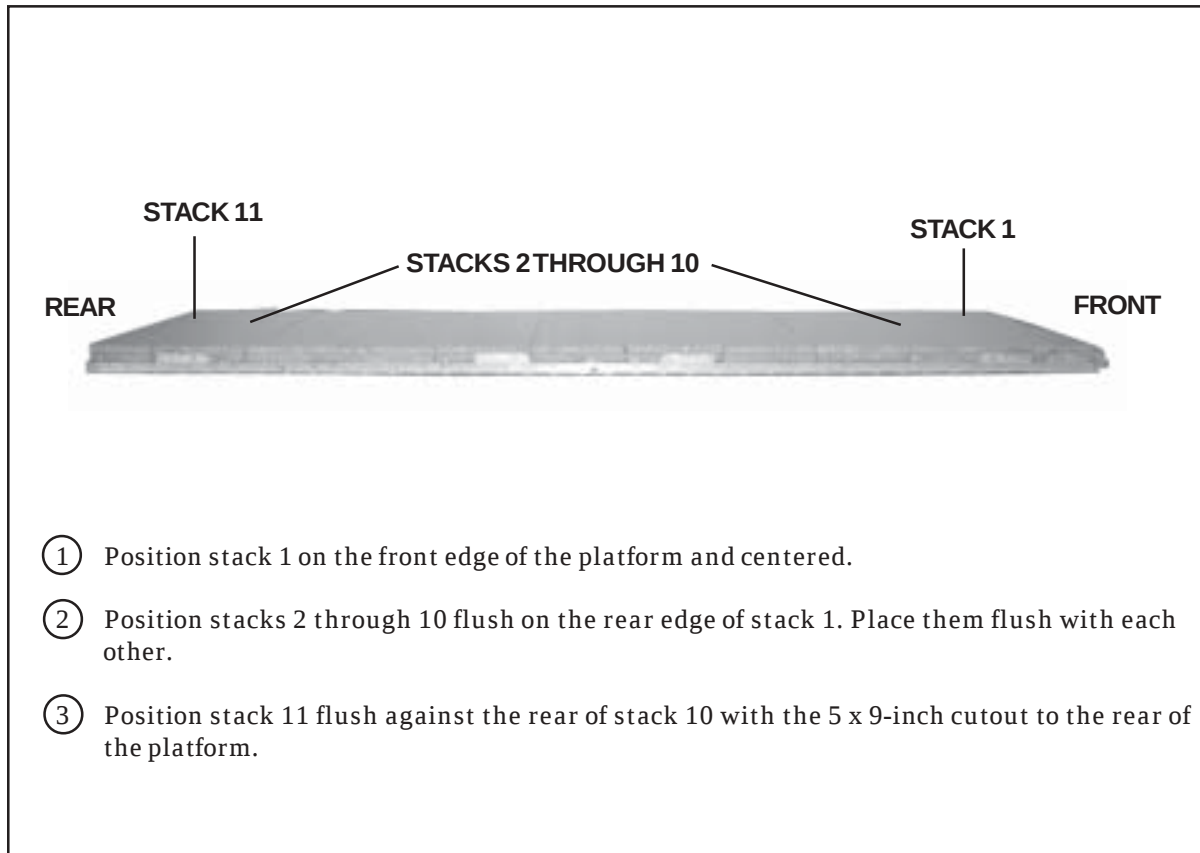


Figure 4-80. Positioning Honeycomb Stacks 1 through 11 Positioned

POSITIONING AND LASHING THE DRUMS

4-60. Position and lash the drums to the platform as shown in Figures 4-81 through 4-92.

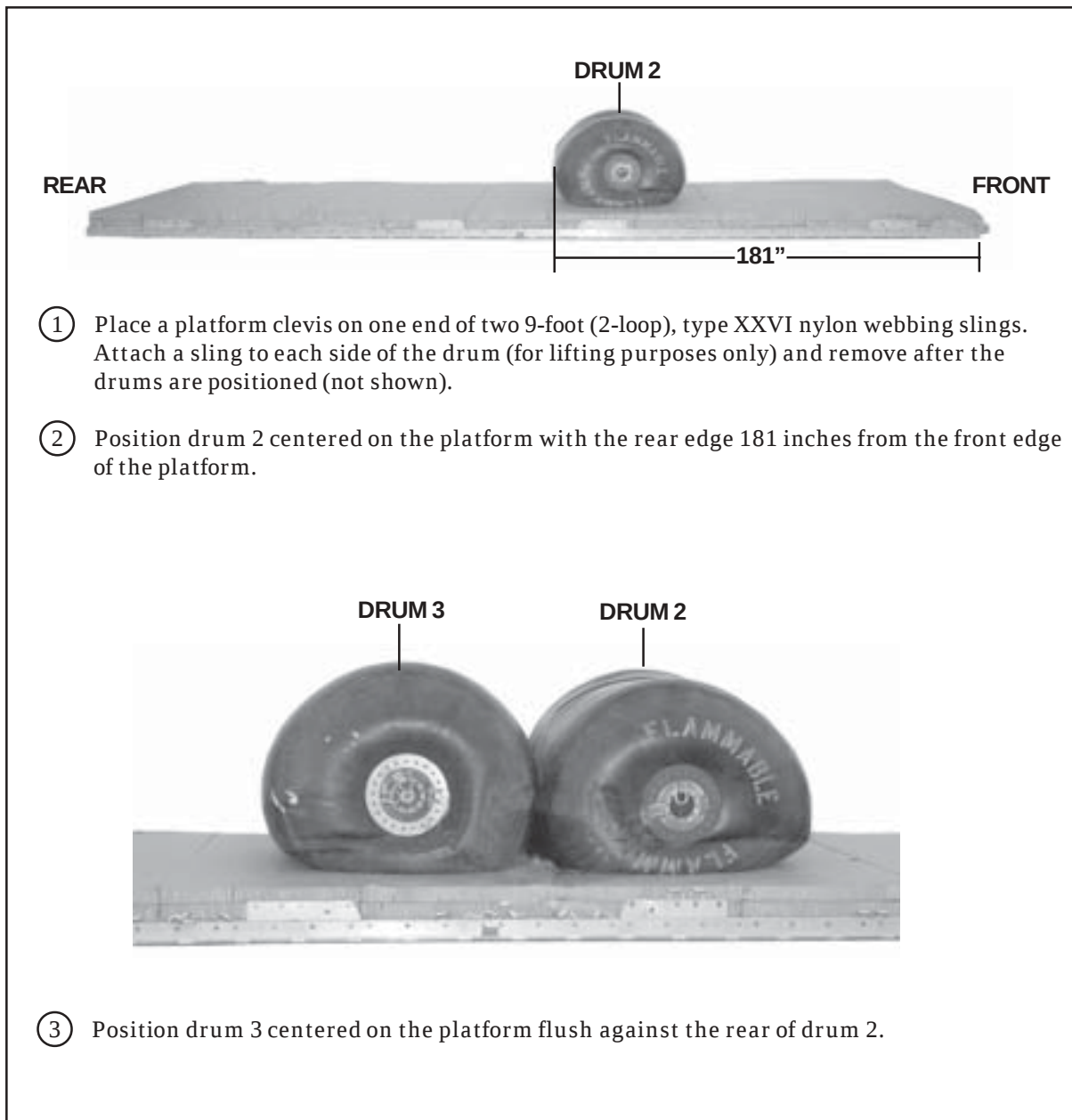


Figure 4-81. Fuel Drums 2 and 3 Positioned

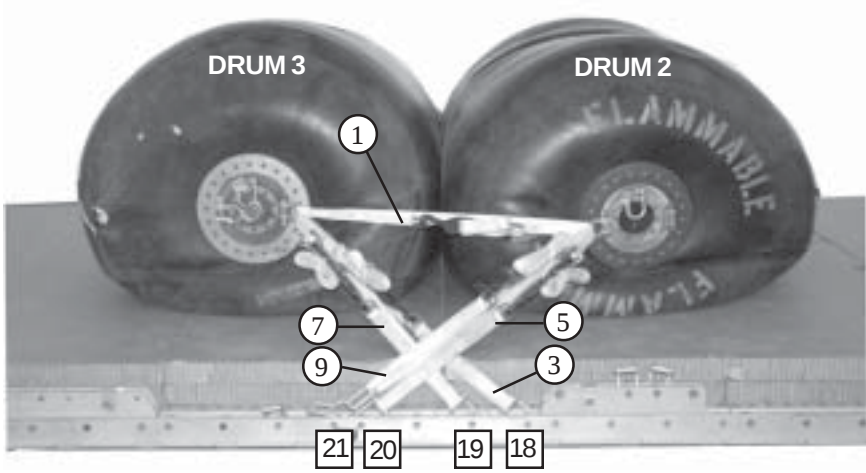
		
Lashing Number	Tie-down Clevis Number	Instructions
1		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the right side.
2		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the left side.
3	18	Route a lashing from clevis 18 to the front right shackle on drum 3.
4	18A	Route a lashing from clevis 18A to the front left shackle on drum 3.
5	20	Route a lashing from clevis 20 to the rear right shackle on drum 2.
6	20A	Route a lashing from clevis 20A to the rear left shackle on drum 2.
7	19	Route a lashing from clevis 19 to the front right shackle on drum 3.
8	19A	Route a lashing from clevis 19A to the front left shackle on drum 3.
9	21	Route a lashing from clevis 21 to the rear right shackle on drum 2.
10	21A	Route a lashing from clevis 21A to the rear left shackle on drum 2.

Figure 4-82. Lashings 1 through 10 Installed

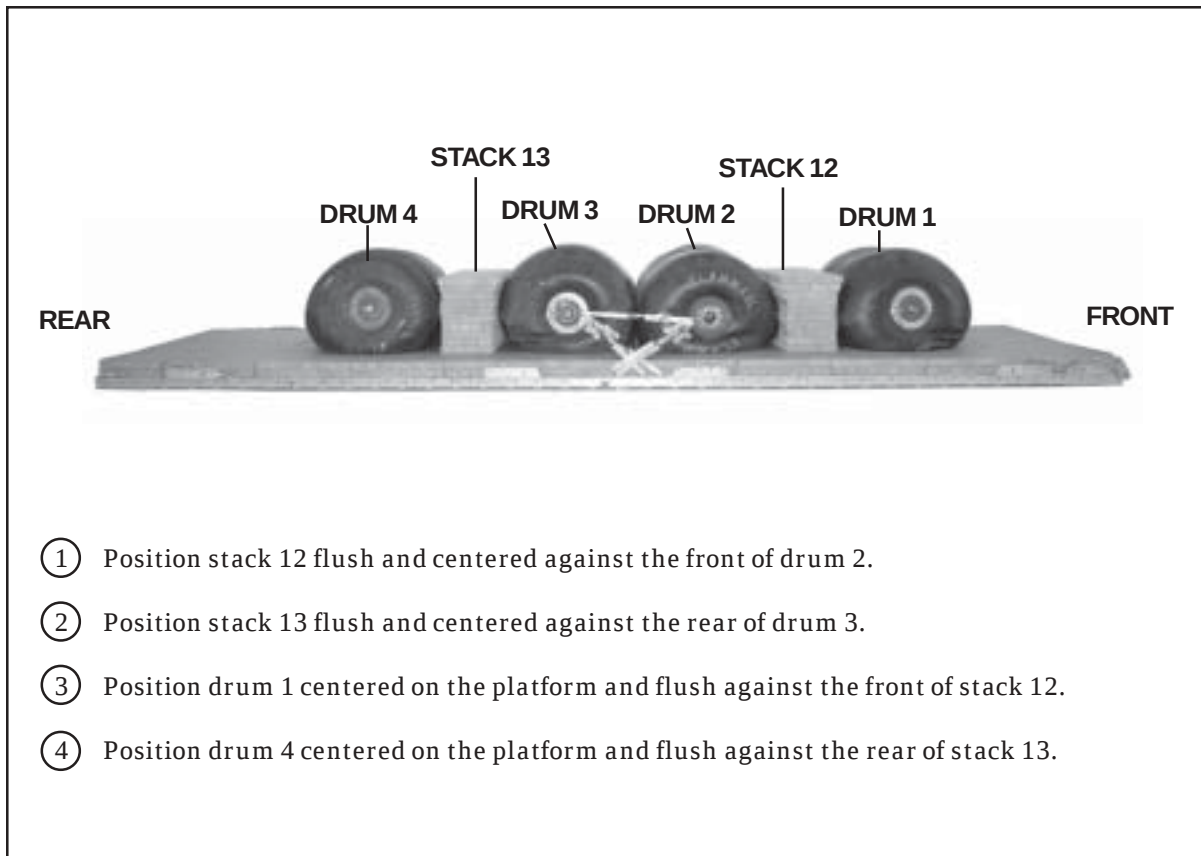


Figure 4-83. Fuel Drums 1 and 4 Positioned

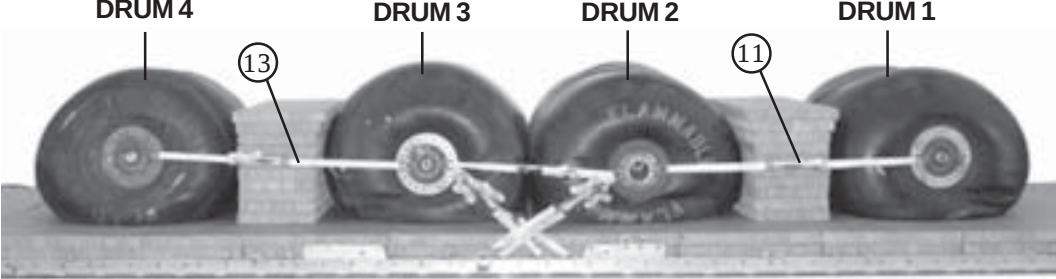
		
Lashing Number	Tie-down Clevis Number	Instructions
11		Route a lashing from the rear shackle of drum 1 to the front shackle of drum 2 on the right side.
12		Route a lashing from the rear shackle of drum 1 to the front shackle of drum 2 on the left side.
13		Route a lashing from the rear shackle of drum 3 to the front shackle of drum 4 on the right side.
14		Route a lashing from the rear shackle of drum 3 to the front shackle of drum 4 on the left side.

Figure 4-84. Lashings 11 through 14 Installed

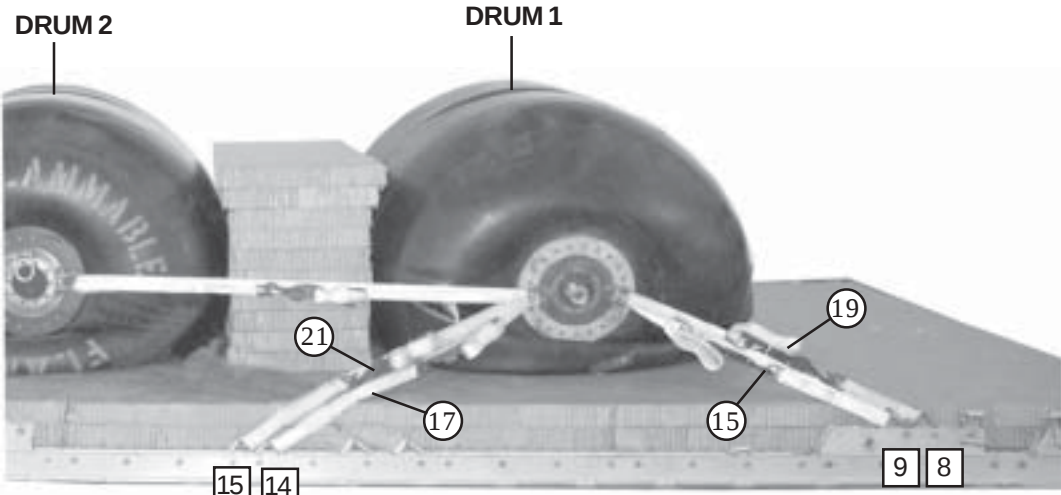
		
Lashing Number	Tie-down Clevis Number	Instructions
15	9	Route a lashing from clevis 9 to the front right shackle on drum 1.
16	9A	Route a lashing from clevis 9A to the front left shackle on drum 1.
17	14	Route a lashing from clevis 14 to the rear right shackle on drum 1.
18	14A	Route a lashing from clevis 14A to the rear left shackle on drum 1.
19	8	Route a lashing from clevis 8 to the front right shackle on drum 1.
20	8A	Route a lashing from clevis 8A to the front left shackle on drum 1.
21	15	Route a lashing from clevis 15 to the rear right shackle on drum 1.
22	15A	Route a lashing from clevis 15A to the rear left shackle on drum 1.

Figure 4-85. Lashings 15 through 22 Installed

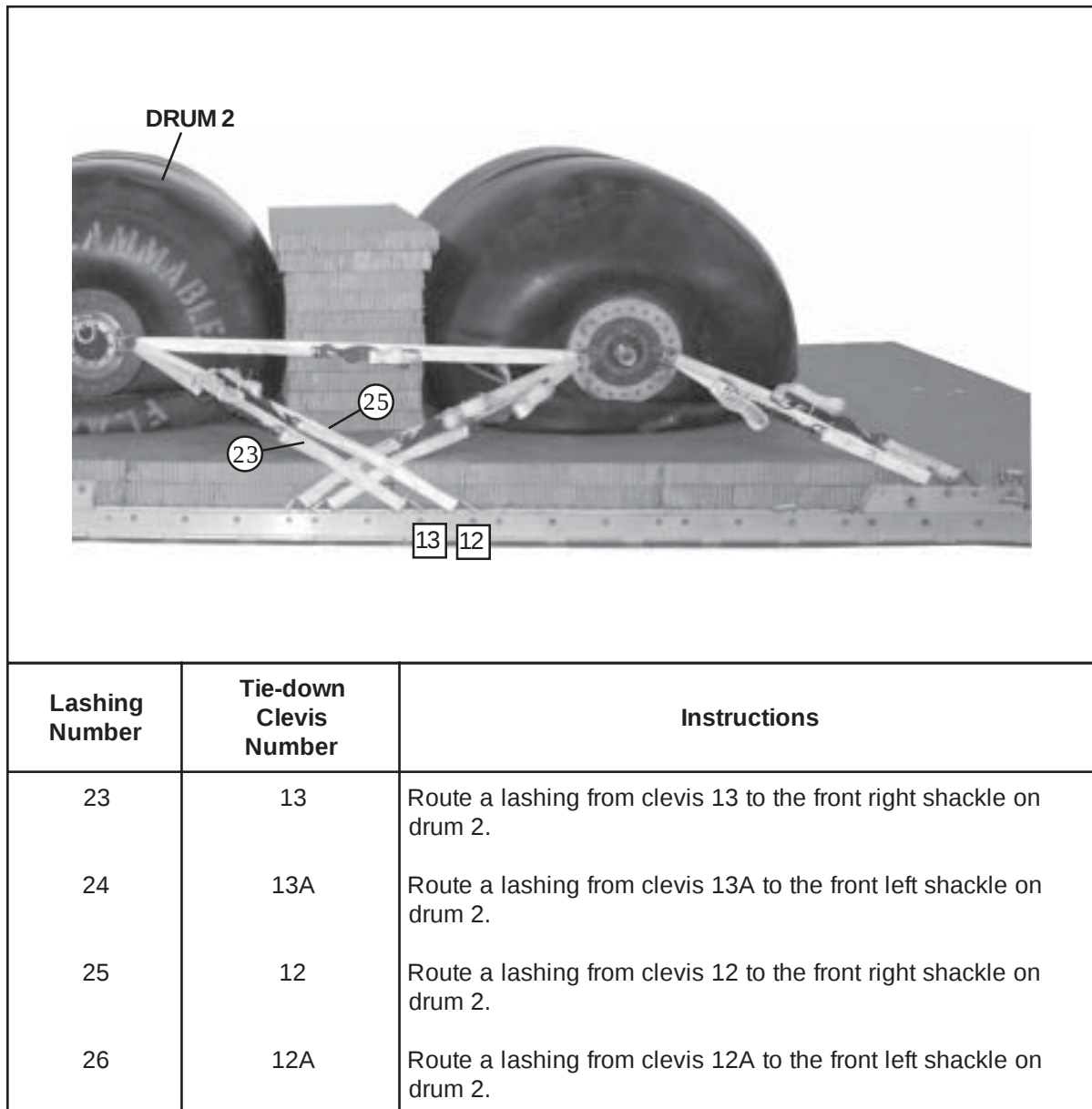


Figure 4-86. Lashings 23 through 26 Installed

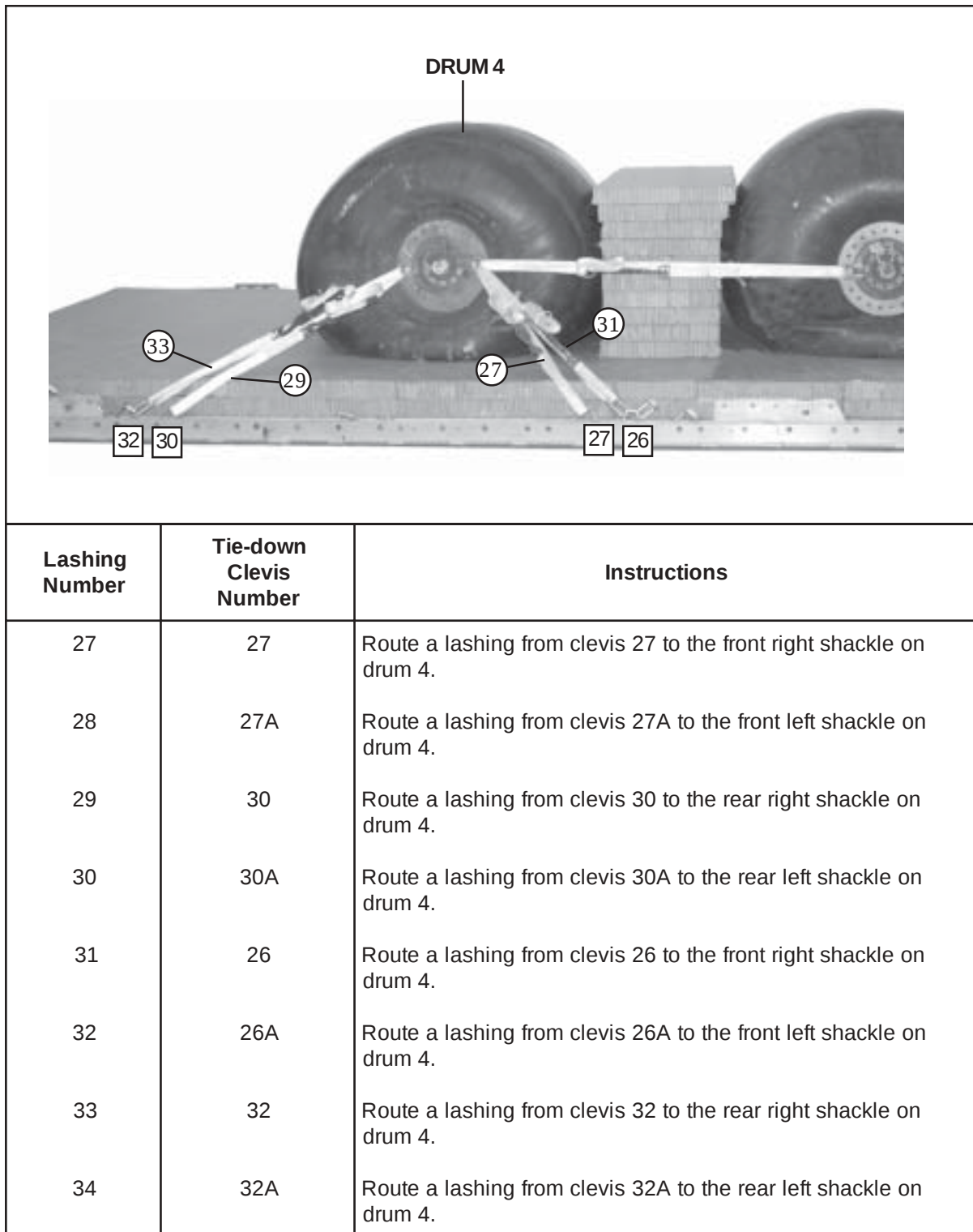


Figure 4-87. Lashings 27 through 34 Installed

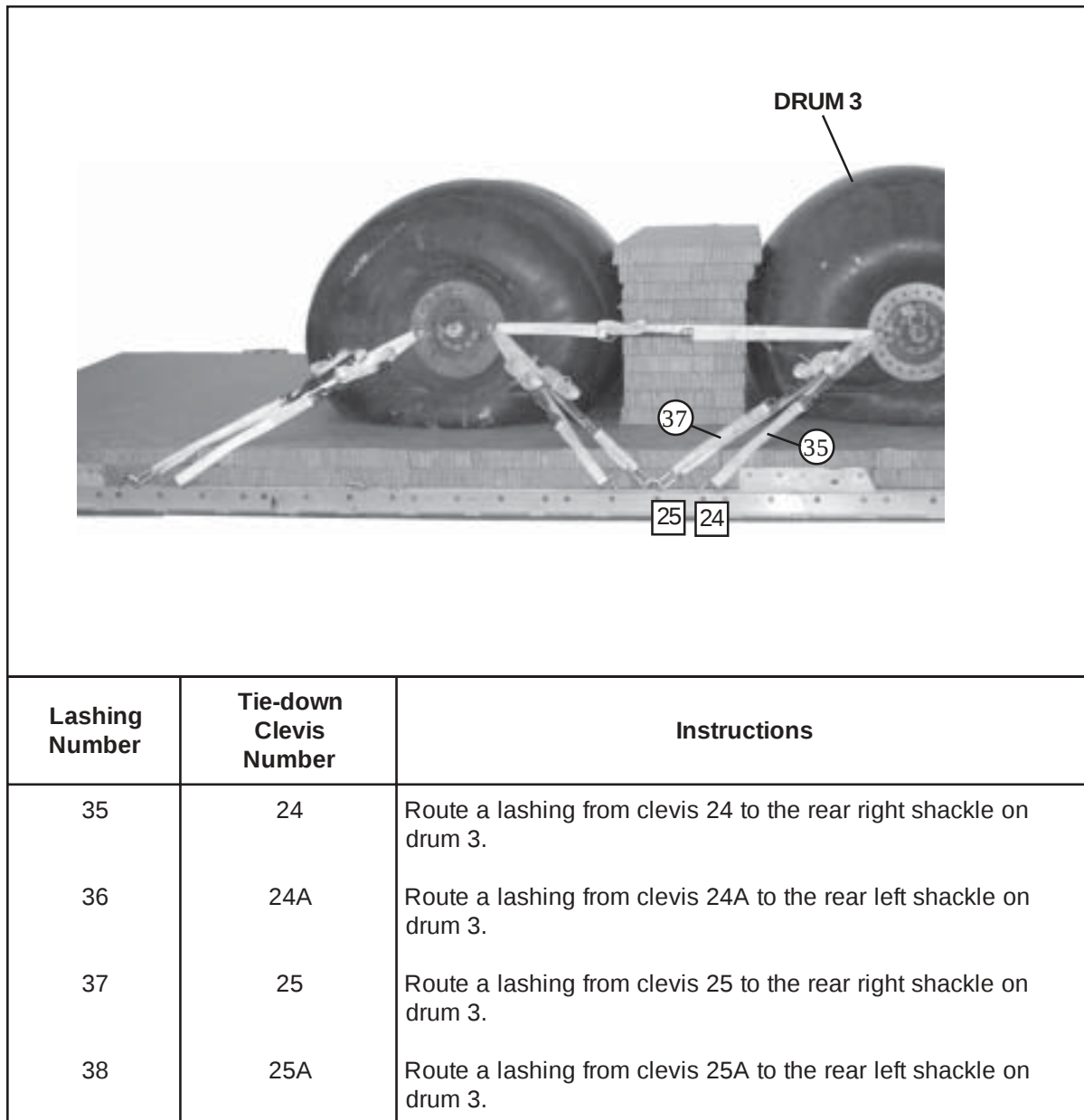


Figure 4-88. Lashings 35 through 38 Installed

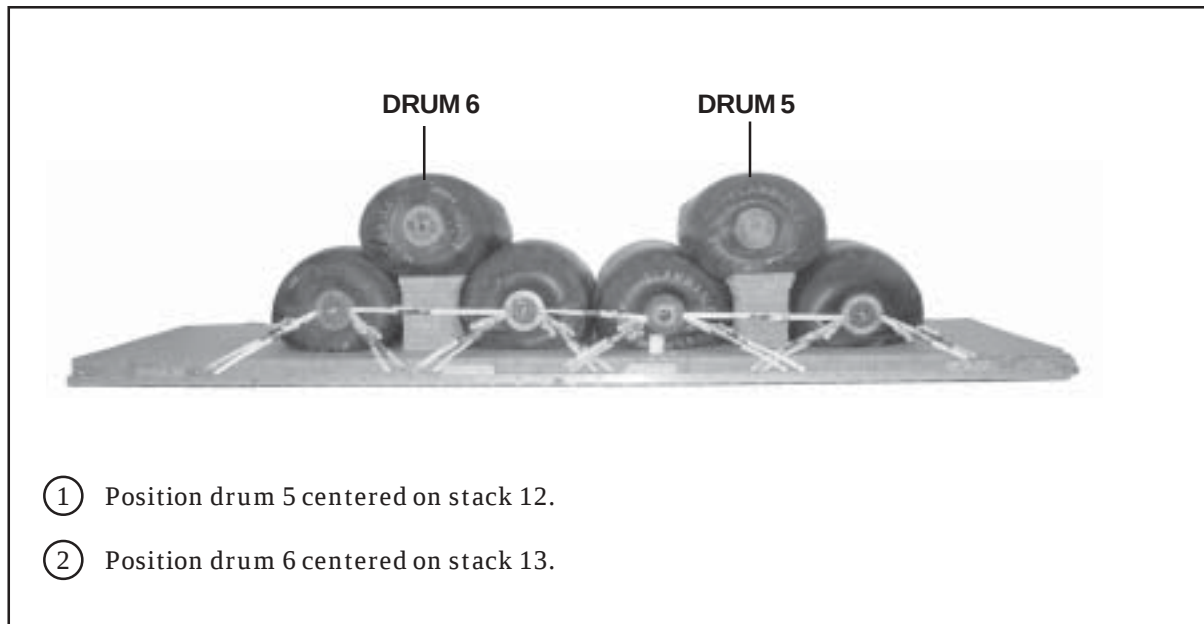


Figure 4-89. Fuel Drums 5 and 6 Positioned

Lashing Number	Tie-down Clevis Number	Instructions
39		Route a lashing from the rear shackle of drum 5 to the front shackle of drum 6 on the right side.
40		Route a lashing from the rear shackle of drum 5 to the front shackle of drum 6 on the left side.

Figure 4-90. Lashings 39 and 40 Installed

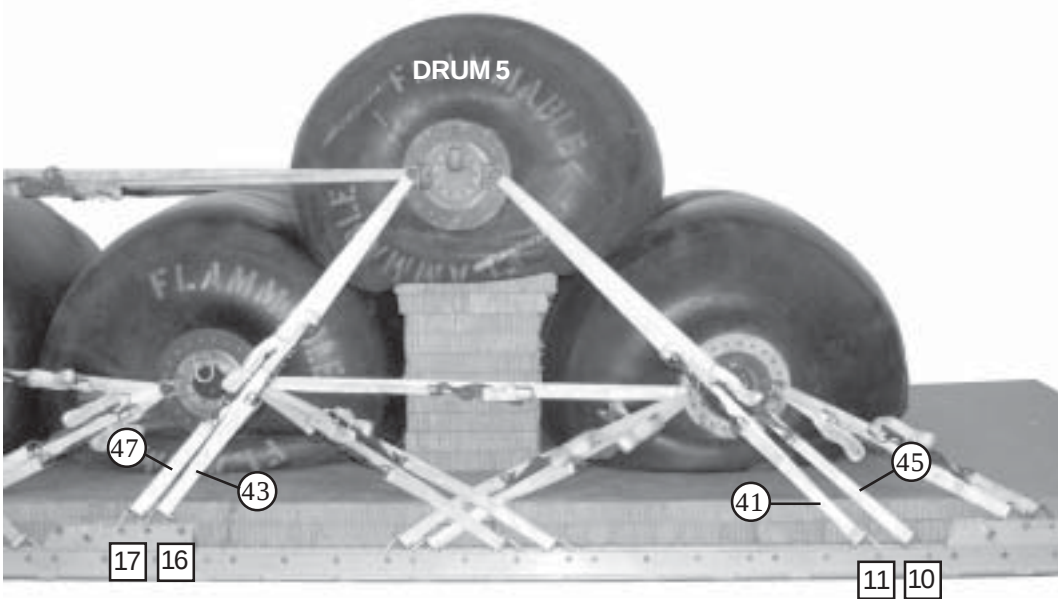
		
Lashing Number	Tie-down Clevis Number	Instructions
41	11	Route a lashing from clevis 11 to the front right shackle on drum 5.
42	11A	Route a lashing from clevis 11A to the front left shackle on drum 5.
43	16	Route a lashing from clevis 16 to the rear right shackle on drum 5.
44	16A	Route a lashing from clevis 16A to the rear left shackle on drum 5.
45	10	Route a lashing from clevis 10 to the front right shackle on drum 5.
46	10A	Route a lashing from clevis 10A to the front left shackle on drum 5.
47	17	Route a lashing from clevis 17 to the rear right shackle on drum 5.
48	17A	Route a lashing from clevis 17A to the rear left shackle on drum 5.

Figure 4-91. Lashings 41 through 48 Installed

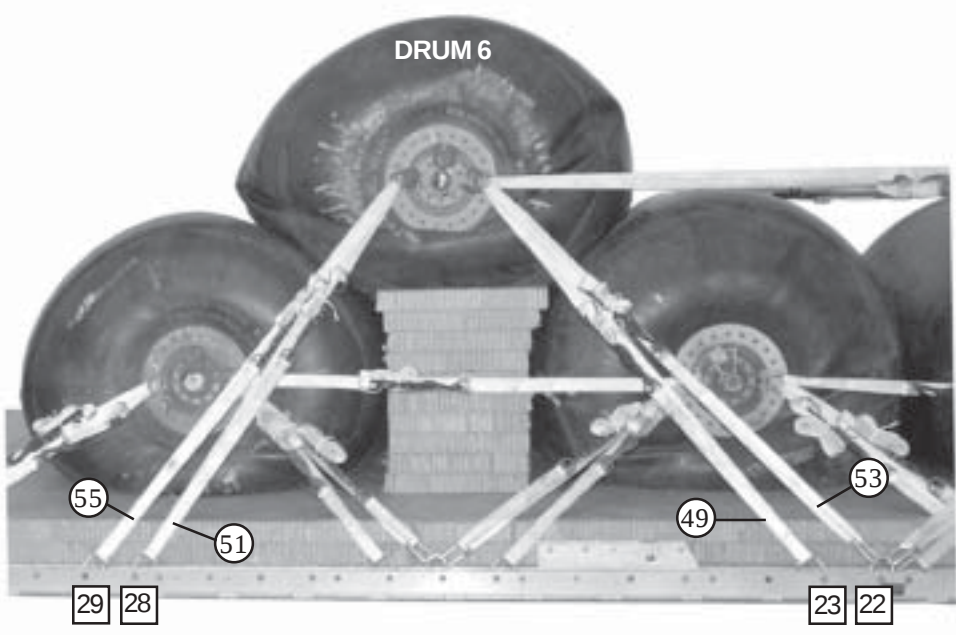
		
Lashing Number	Tie-down Clevis Number	Instructions
49	23	Route a lashing from clevis 23 to the front right shackle on drum 6.
50	23A	Route a lashing from clevis 23A to the front left shackle on drum 6.
51	28	Route a lashing from clevis 28 to the rear right shackle on drum 6.
52	28A	Route a lashing from clevis 28A to the rear left shackle on drum 6.
53	22	Route a lashing from clevis 22 to the front right shackle on drum 6.
54	22A	Route a lashing from clevis 22A to the front left shackle on drum 6.
55	29	Route a lashing from clevis 29 to the rear right shackle on drum 6.
56	29A	Route a lashing from clevis 29A to the rear left shackle on drum 6.

Figure 4-92. Lashings 49 through 56 Installed

BUILDING THE EQUIPMENT BOXES

4-61. Build the front and rear equipment boxes as shown in Figures 4-93 and 4-94.

a. Build the front equipment box using 16d nails and as shown in Figure 4-93.

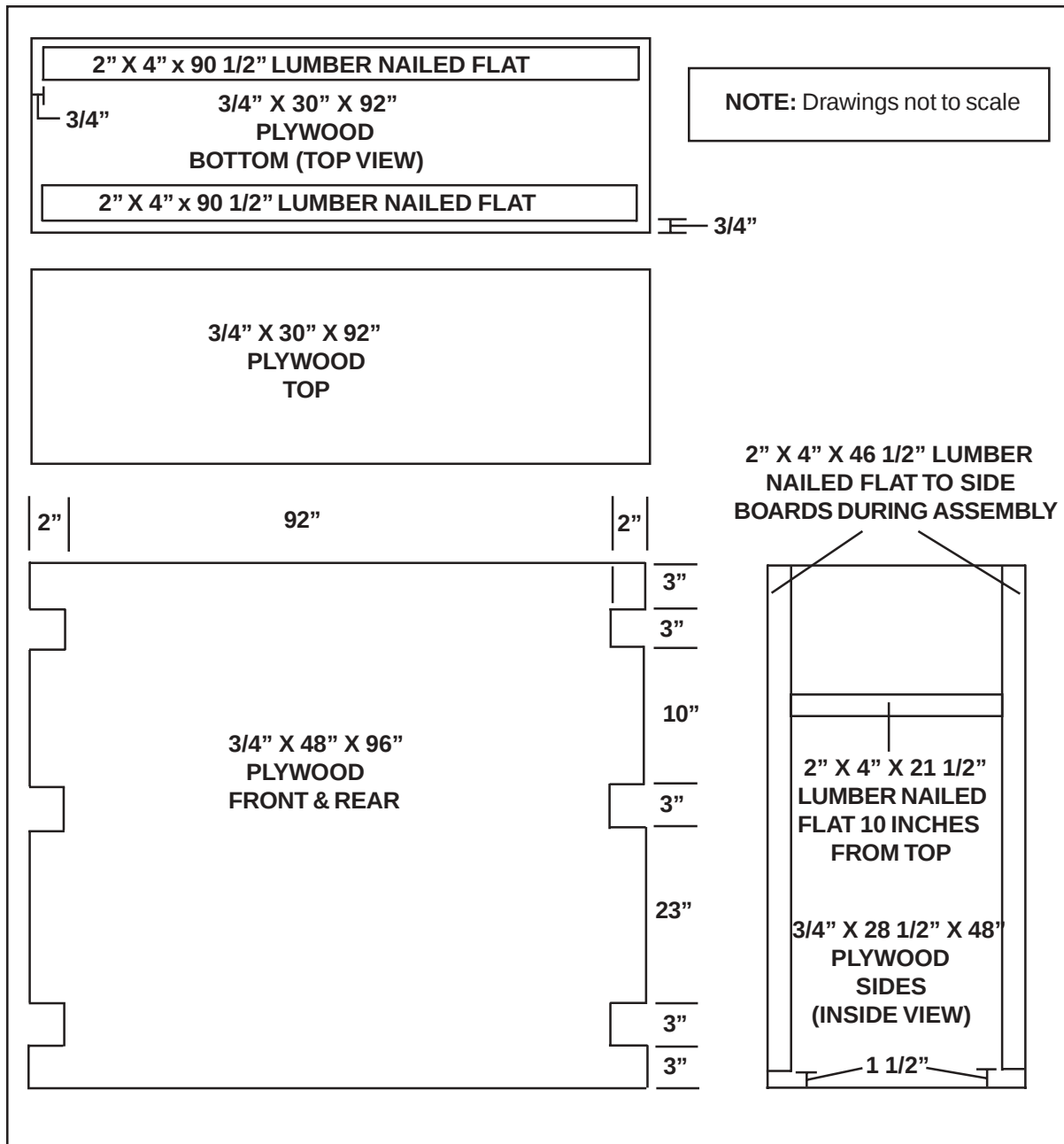


Figure 4-93. Front Equipment Box Built

- b.** Build the rear equipment box using 16d nails and as shown in Figure 4-94.

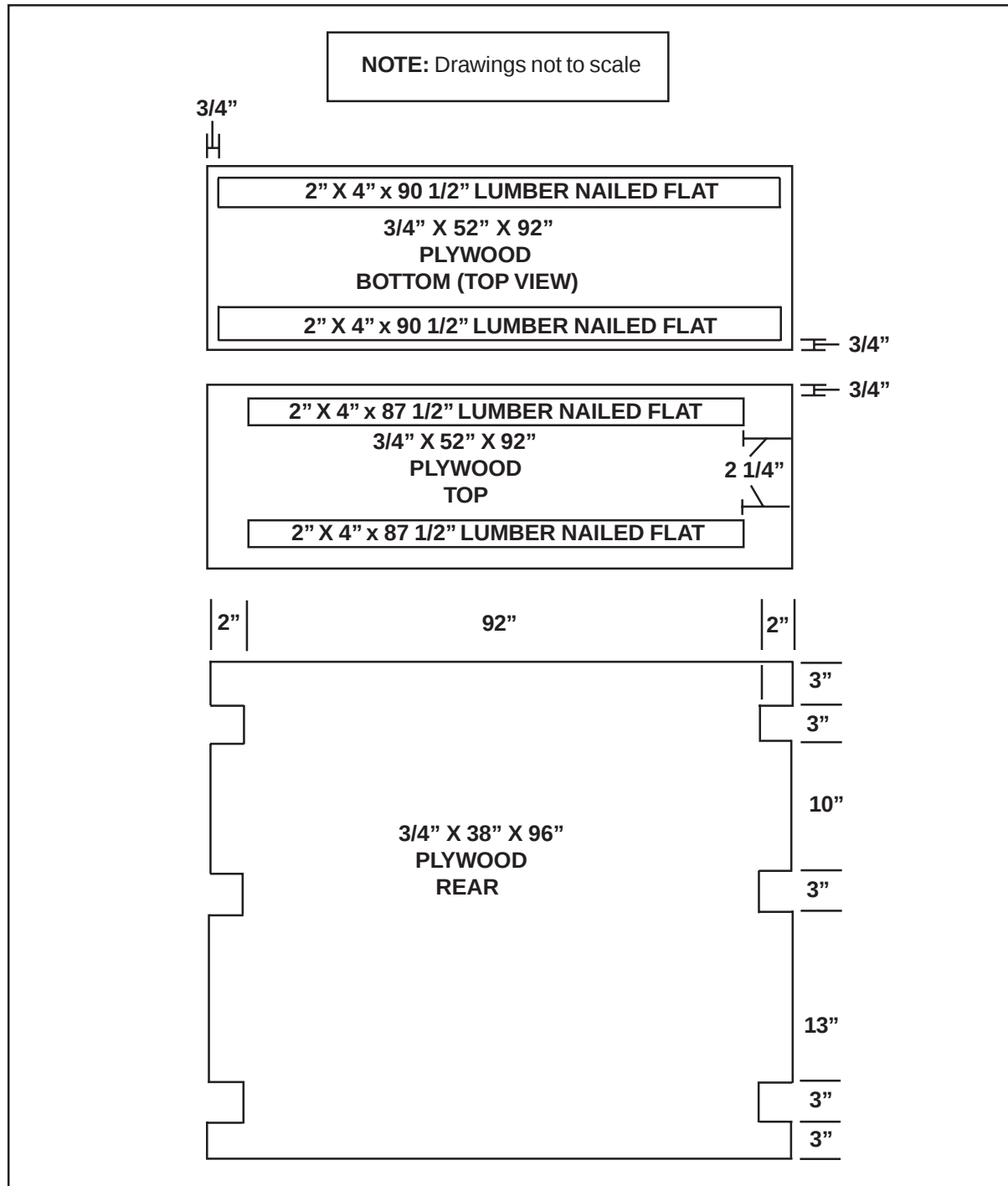


Figure 4-94. Rear Equipment Box Built

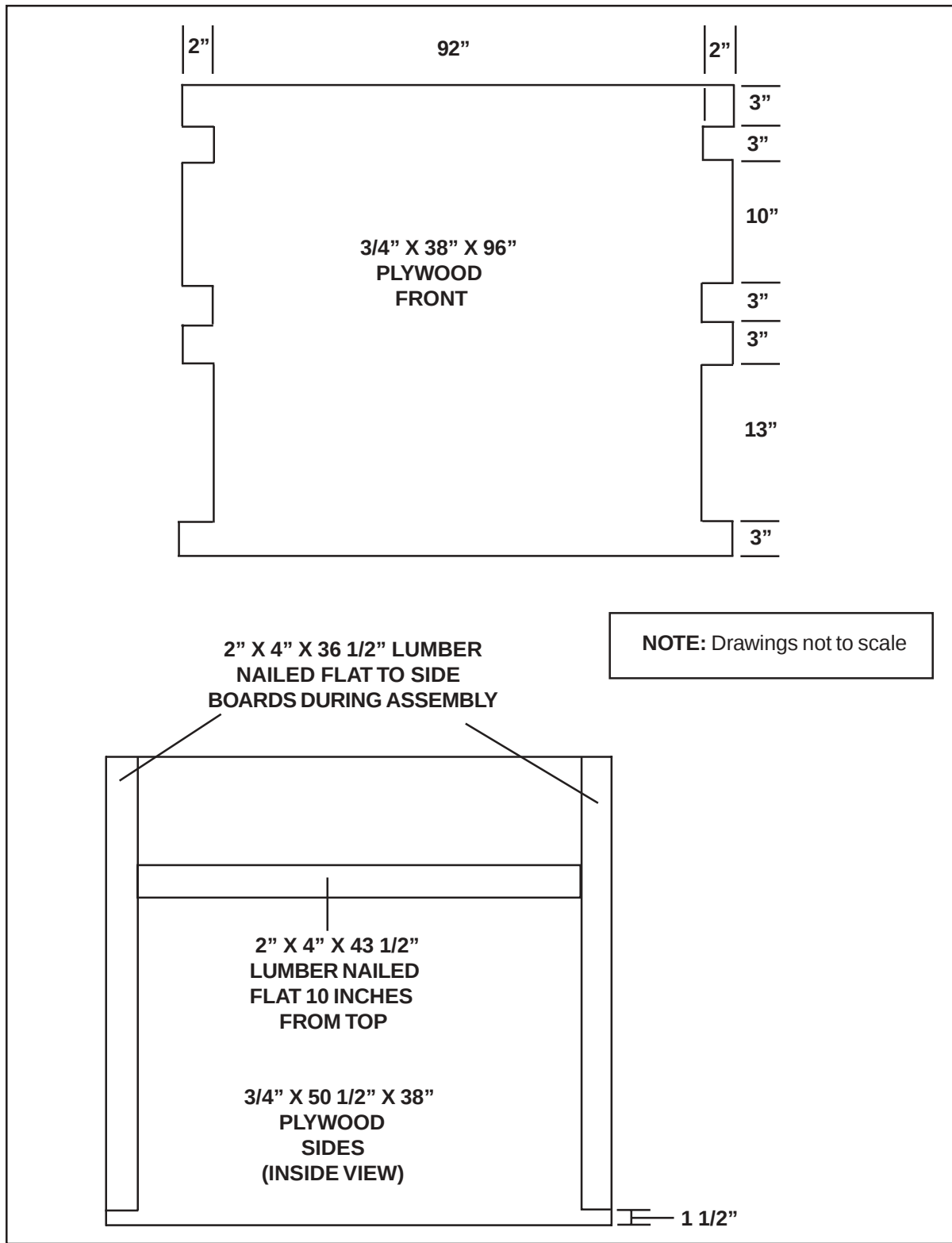
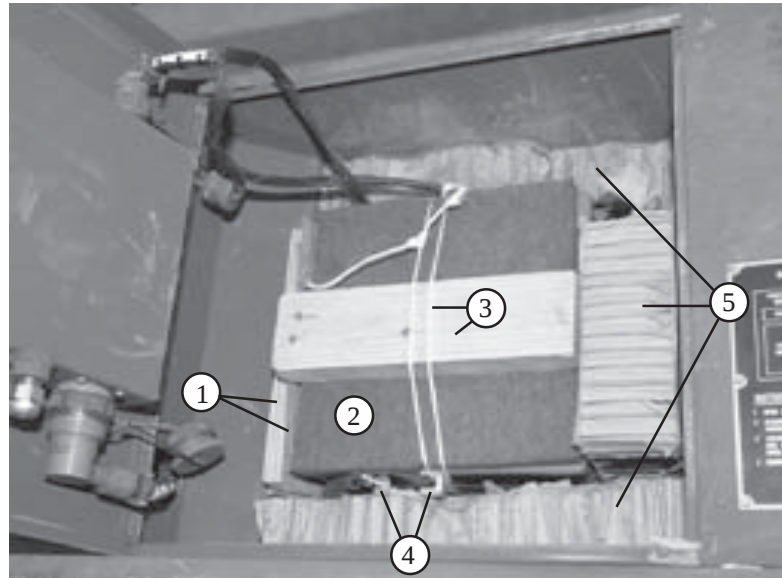


Figure 4-94. Rear Equipment Box Built (Continued)

PREPARING EQUIPMENT FOR EQUIPMENT BOXES

4-62. Prepare the fire extinguishers, filter separator, explosion proof motor, pumps, manuals and toolkit as explained and shown in paragraph 4-6. Using the lists printed on the equipment bags, place the equipment indicated on each list into its bag. Prepare and secure the battery box as shown in Figure 4-95.



- ① Place a 3/4-inch by 10-inch by 10-inch piece of plywood behind the battery inside the compartment. Place a 1/4-inch by 10-inch by 10-inch piece of felt between the plywood and the battery.
- ② Place a 1/4-inch by 10-inch 10-inch piece of felt on top of the battery.
- ③ Place a 2-inch by 4-inch by 10-inch piece of lumber on top of the felt. Secure it with type III nylon cord.
- ④ Place cellulose wadding around the battery cap. Disconnect the battery, hold down rods and lay aside.
- ⑤ Fill the remainder of the compartment with pieces of honeycomb. Close and secure lid (not shown).
- ⑥ Secure the intake filter and grounding wire as shown in Figure 4-11, steps 4 and 5.

Figure 4-95. Battery Box Secured

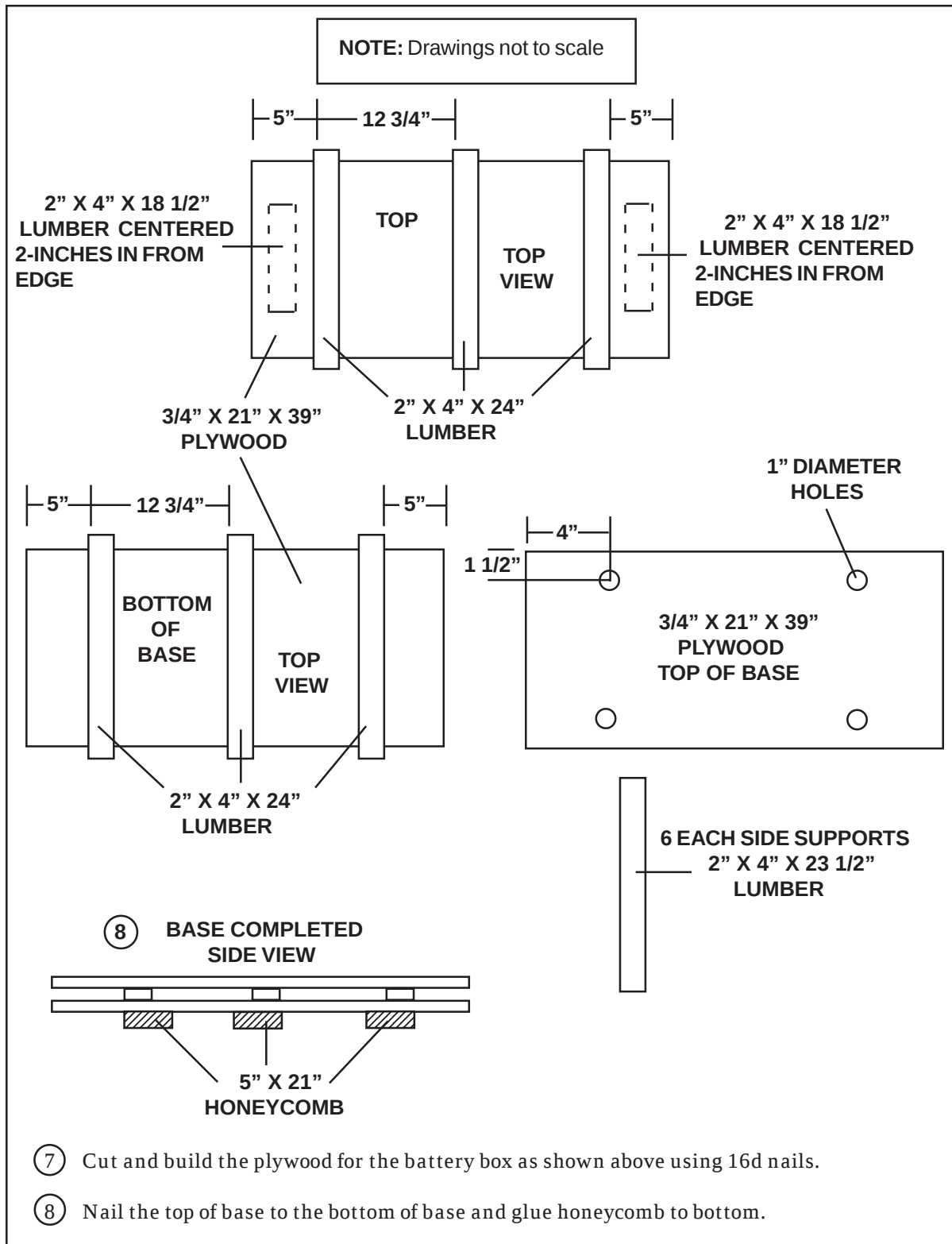
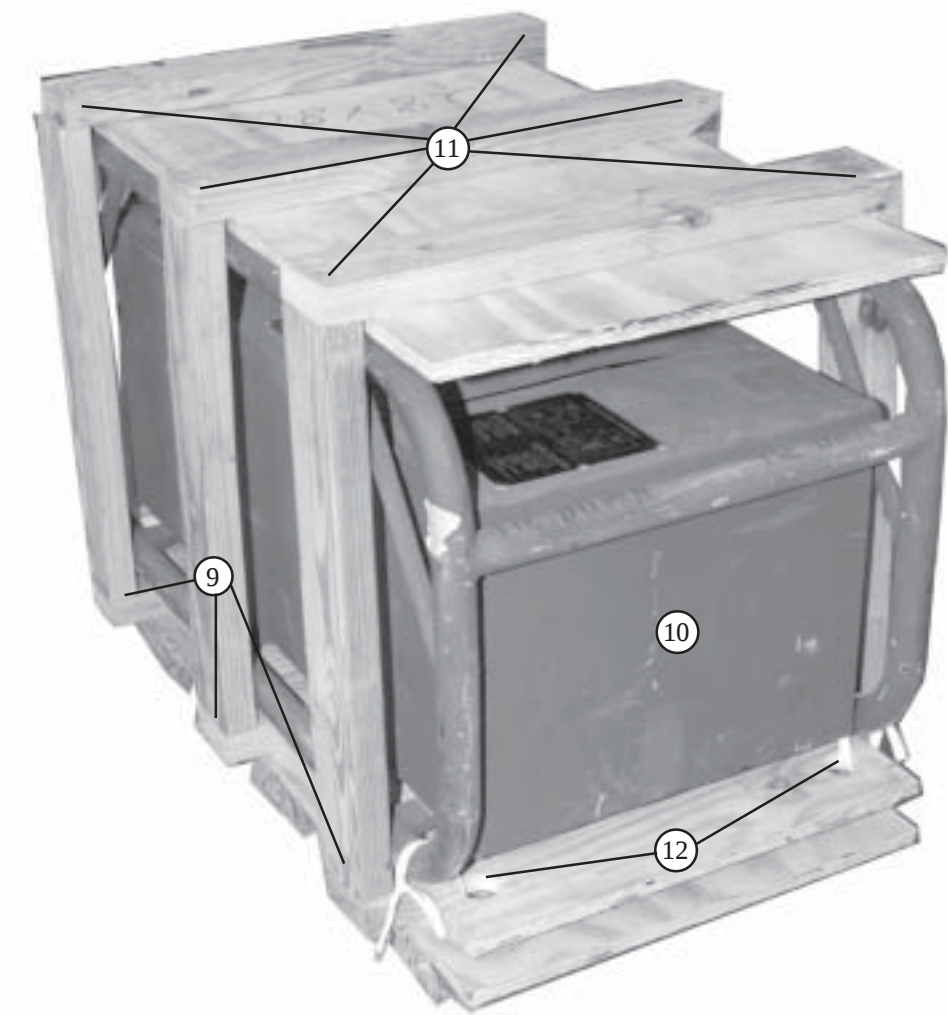


Figure 4-95. Battery Box Secured (Continued)



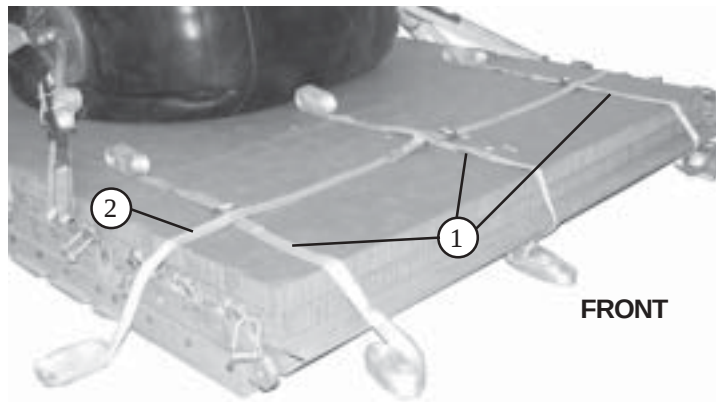
- ⑨ Nail the six 2-inch by 4-inch by 23 1/2-inch lumber side supports to the 2 X 4 lumber extending from the sides of the base using 16d nails.
- ⑩ Position the battery box inside the frame centered.
- ⑪ Position the top board on top of the battery box centered and nail to the six lumber side supports using 16d nails.
- ⑫ Using four lengths of single 1/2-inch tubular nylon, tie the base to the frame of the battery box using the four corner holes.

Figure 4-95. Battery Box Secured (Continued)

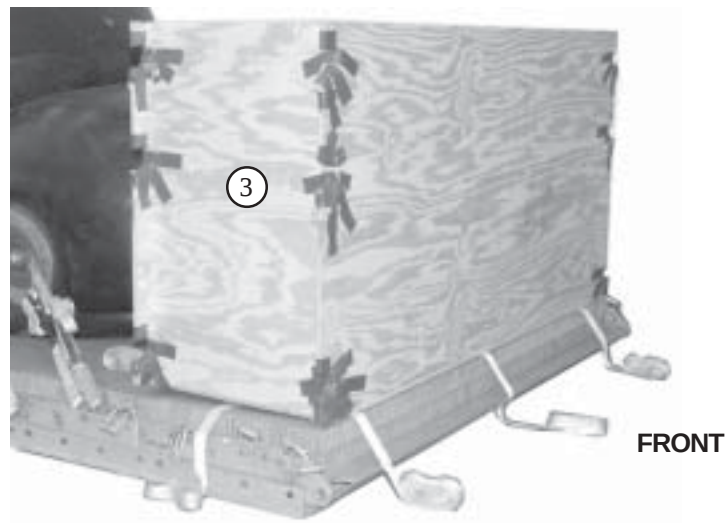
POSITIONING EQUIPMENT BOXES

4-63. Prepare and position the front and rear equipment boxes as shown in Figures 4-96 and 4-97.

a. Prepare and position the front equipment box as shown in Figure 4-96.



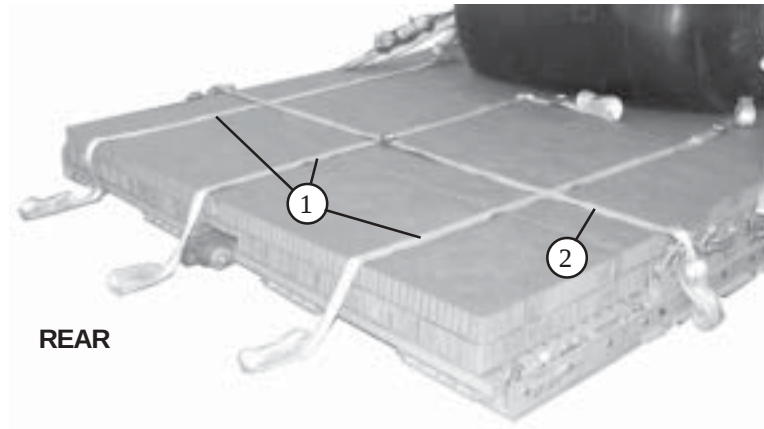
- ① Pre-position three 30-foot lashings lengthwise across the end honeycomb stacks on the front of the platform. Place the two outside lashings 15-inches in from the outside edges of the honeycomb stacks. Place the third lashing centered on the honeycomb stacks.
- ② Pre-position a 30-foot lashing across the width of the front honeycomb stacks 21-inches in from the front honeycomb edge.



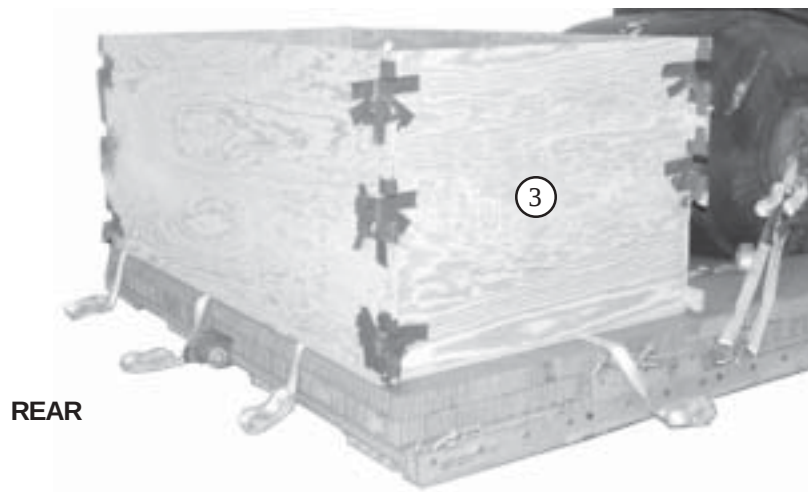
- ③ Position the front equipment box flush with the front honeycomb edge and centered. Pad and tape all cutouts using cellulose wadding.

Figure 4-96. Front Equipment Box Positioned

b. Prepare and position the rear equipment box as shown in Figure 4-97.



- ① Pre-position three 30-foot lashings lengthwise across the end honeycomb stacks on the rear of the platform. Place the two outside lashings 15 inches in from the outside edges of the honeycomb stacks. Place the third lashing centered on the honeycomb stacks. Ensure the D-rings are placed behind drum 4 and not under the box.
- ② Pre-position a 30-foot lashing across the width of the rear honeycomb stacks 26 inches in from the front honeycomb edge.



- ③ Position the rear equipment box flush with the rear honeycomb edge and centered. Pad and tape all cutouts using cellulose wadding.

Figure 4-97. Rear Equipment Box Positioned

POSITIONING AND SECURING EQUIPMENT IN EQUIPMENT BOXES

4-64. Position and secure equipment in equipment boxes as shown in Figures 4-98 and 4-99.

a. Prepare the front equipment box by placing a 22-inch by 82-inch piece of honeycomb in the floor of the box and a 23-inch by 35-inch piece of honeycomb against each end of the box below the 2x4 lumber. Position equipment in the front equipment box as shown in Figure 4-98.

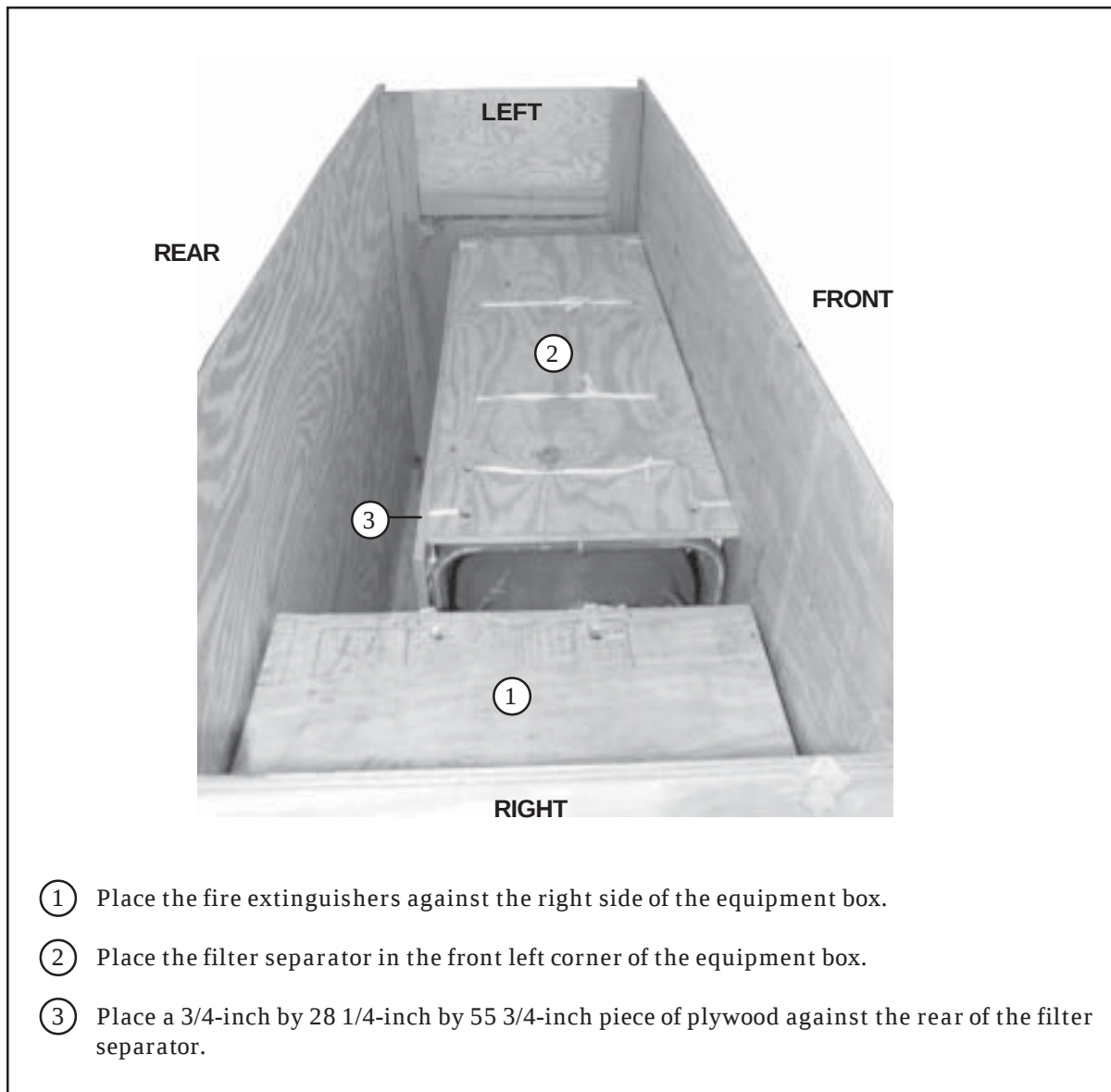
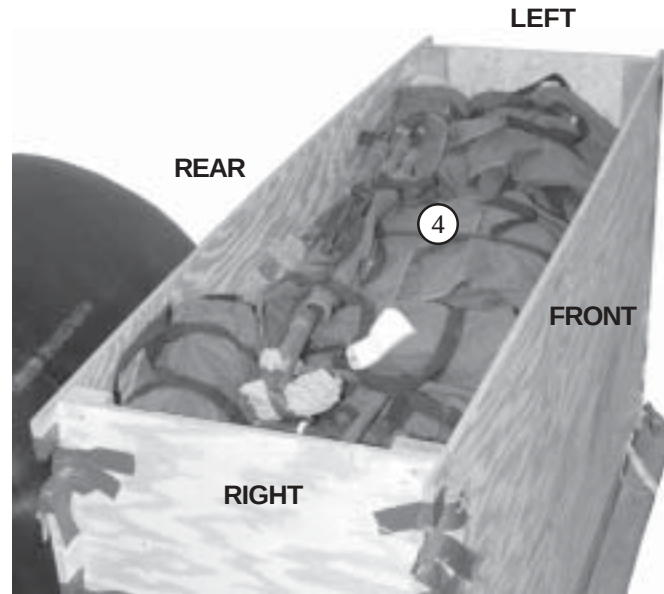
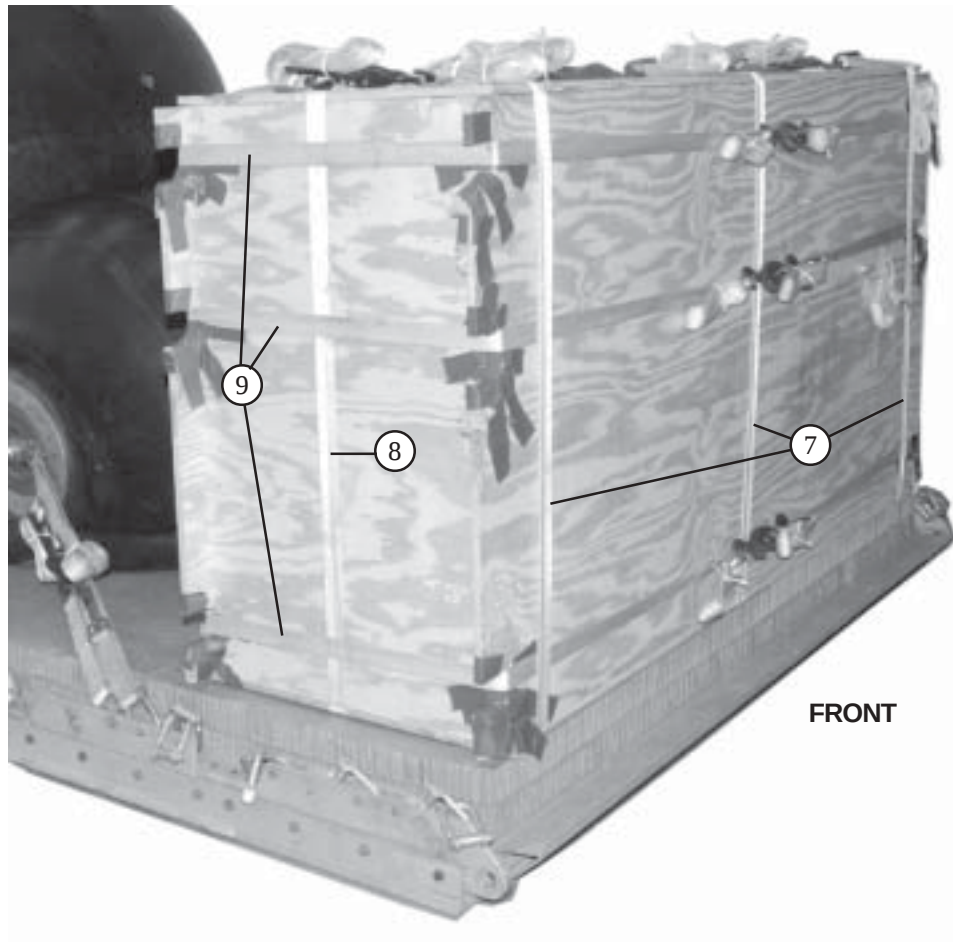


Figure 4-98. Equipment Positioned and Secured in Front Box



- ④ Place the following items in the front equipment box.
- a) One bag containing three 50-foot x 2-inch hoses.
 - b) Two bags containing one 50-foot x 2-inch and one 12-foot x 2-inch discharge hose in each bag.
 - c) One bag containing a 50-foot x 3-inch discharge fitting.
 - d) Two bags containing five suction hoses each.
 - e) One bag containing four grounding rods.
 - f) Tow bar.
 - g) Four bags containing three nozzles each.
- ⑤ Fill the remaining space with honeycomb to prevent movement (not shown).
- ⑥ Nail the top on the box (not shown).

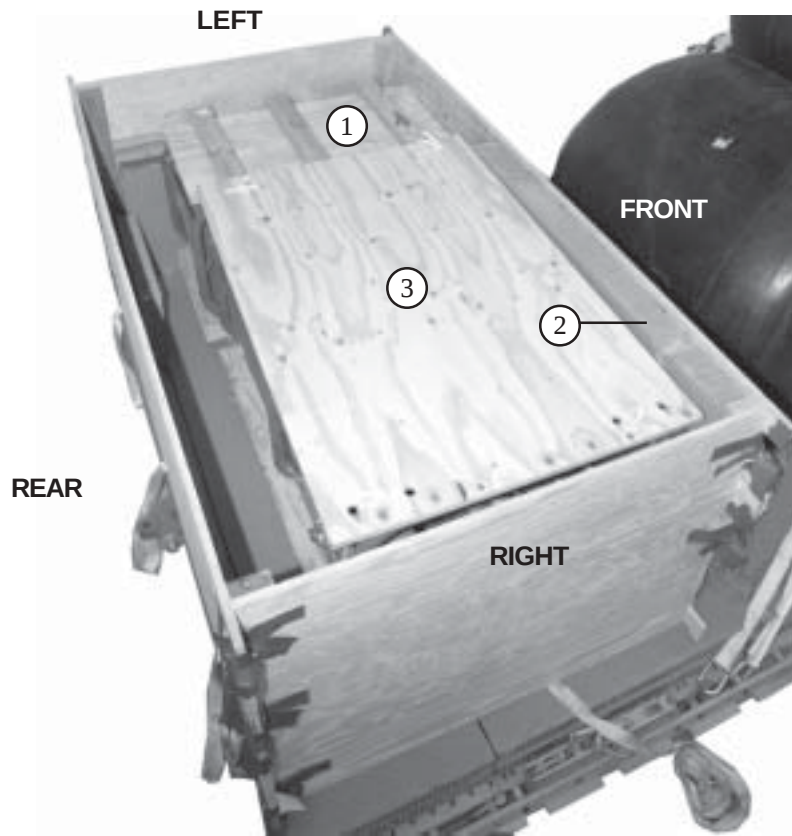
Figure 4-98. Equipment Positioned and Secured in Front Box (Continued)



- ⑦ Secure the box from front to rear using the three pre-positioned 30-foot lashings. Load bind on top of the box.
- ⑧ Secure the box from left to right using the pre-positioned 30-foot lashing. Load bind on top of the box.
- ⑨ Route three 30-foot lashings around the box using the bottom, middle, and top cut outs. Load bind on the front of the box.

Figure 4-98. Equipment Positioned and Secured in Front Box (Continued)

b. Prepare the rear equipment box by placing a 36-inch by 86-inch and a 7-inch by 86-inch piece of honeycomb in the floor of the box. Position a 36-inch by 43-inch piece of honeycomb against each end of the box below the 2x4 lumber. Position equipment in the rear equipment box as shown in Figure 4-99.



- ① Place the battery box against the left front side of the box.
- ② Place a 34-inch by 56-inch piece of honeycomb against the front right side of the box.
- ③ Place the pump, with the inlet valves forward, against the front right side of the box.

Figure 4-99. Equipment Positioned and Secured in Rear Box

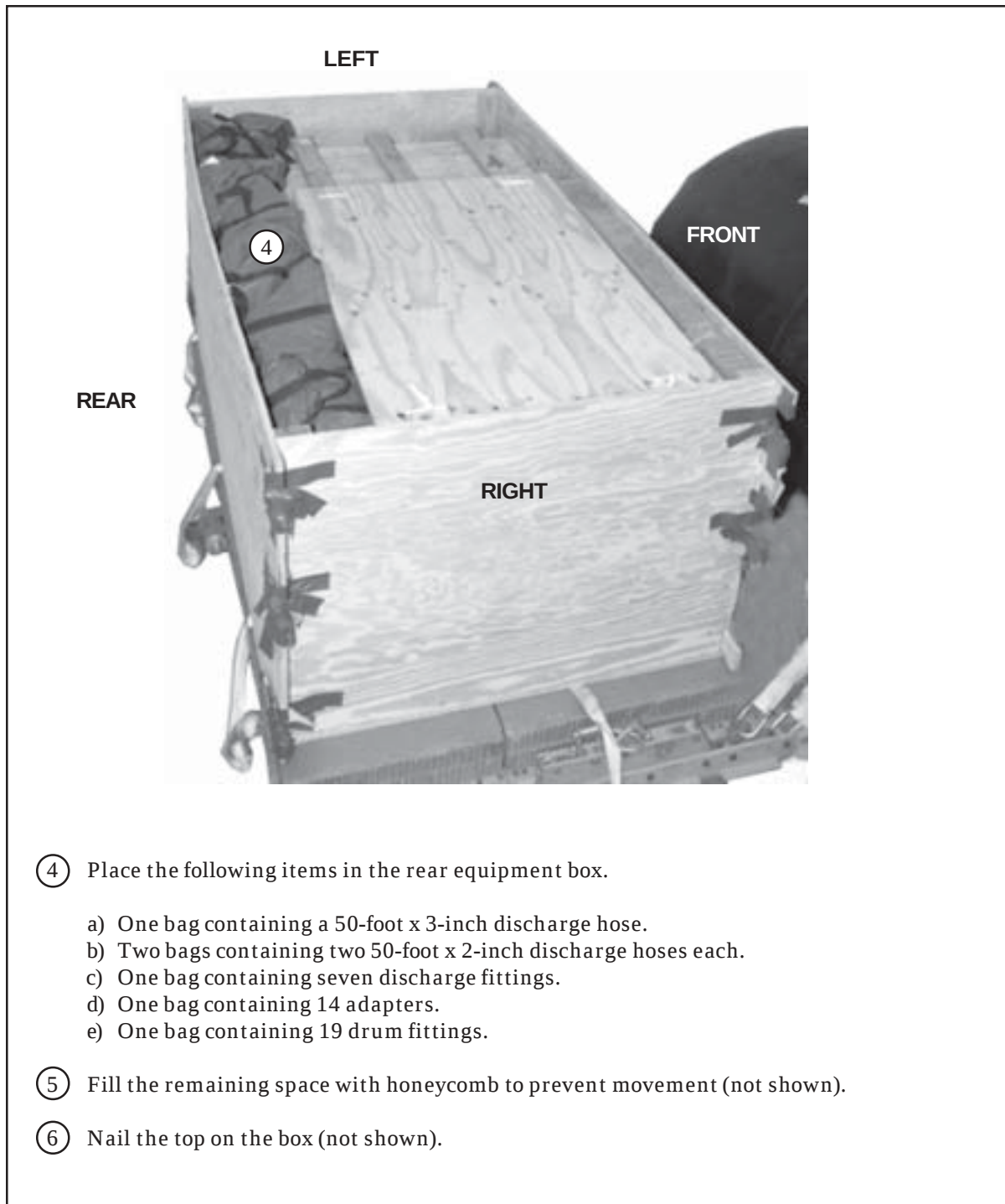


Figure 4-99. Equipment Positioned and Secured in Rear Box (Continued)

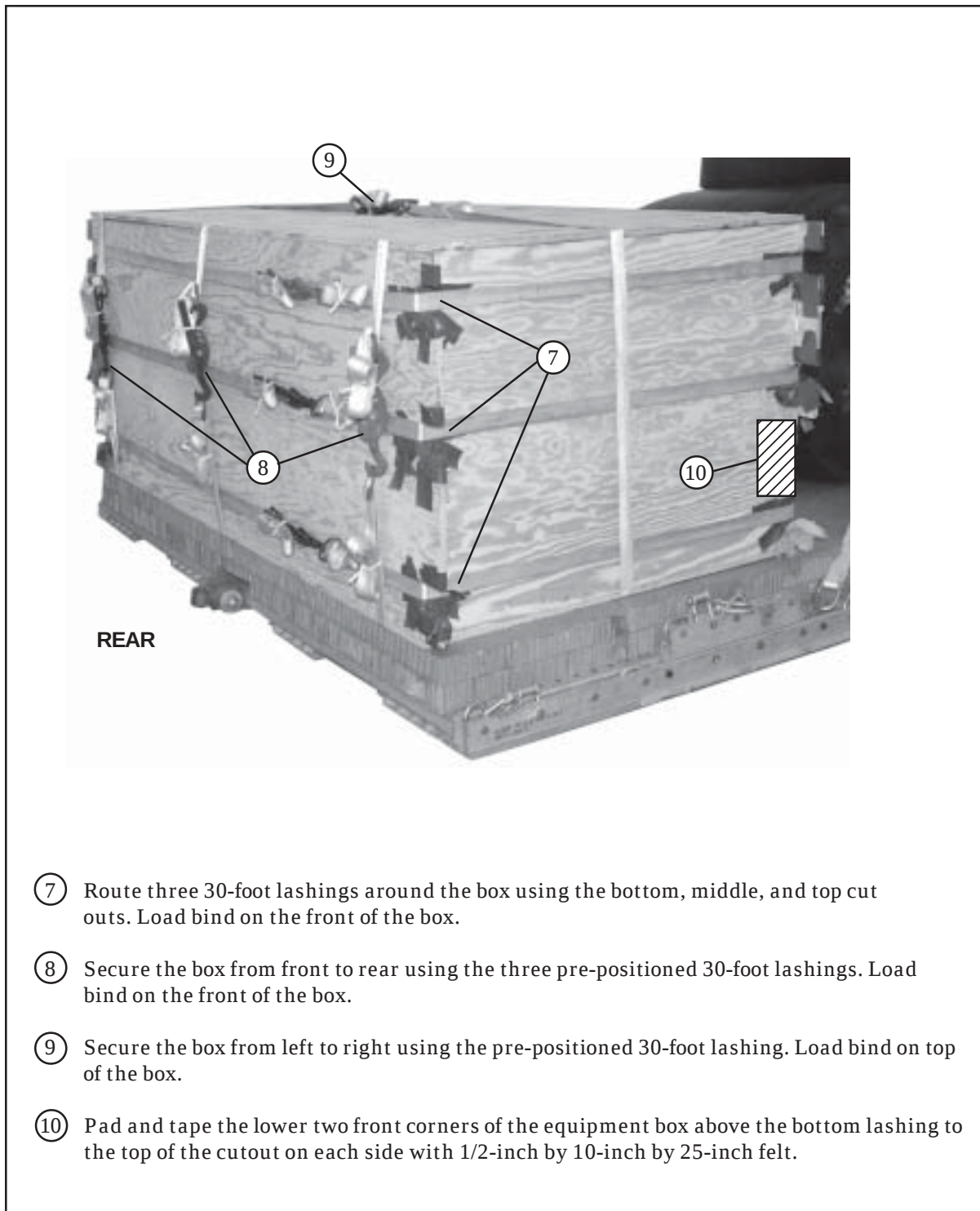


Figure 4-99. Equipment Positioned and Secured in Rear Box (Continued)

LASHING THE EQUIPMENT BOXES TO THE PLATFORM

4-65. Lash the equipment boxes as shown in Figures 4-100 through 4-105.

a. Lash the front equipment box to the platform as shown in Figures 4-100 through 4-102.

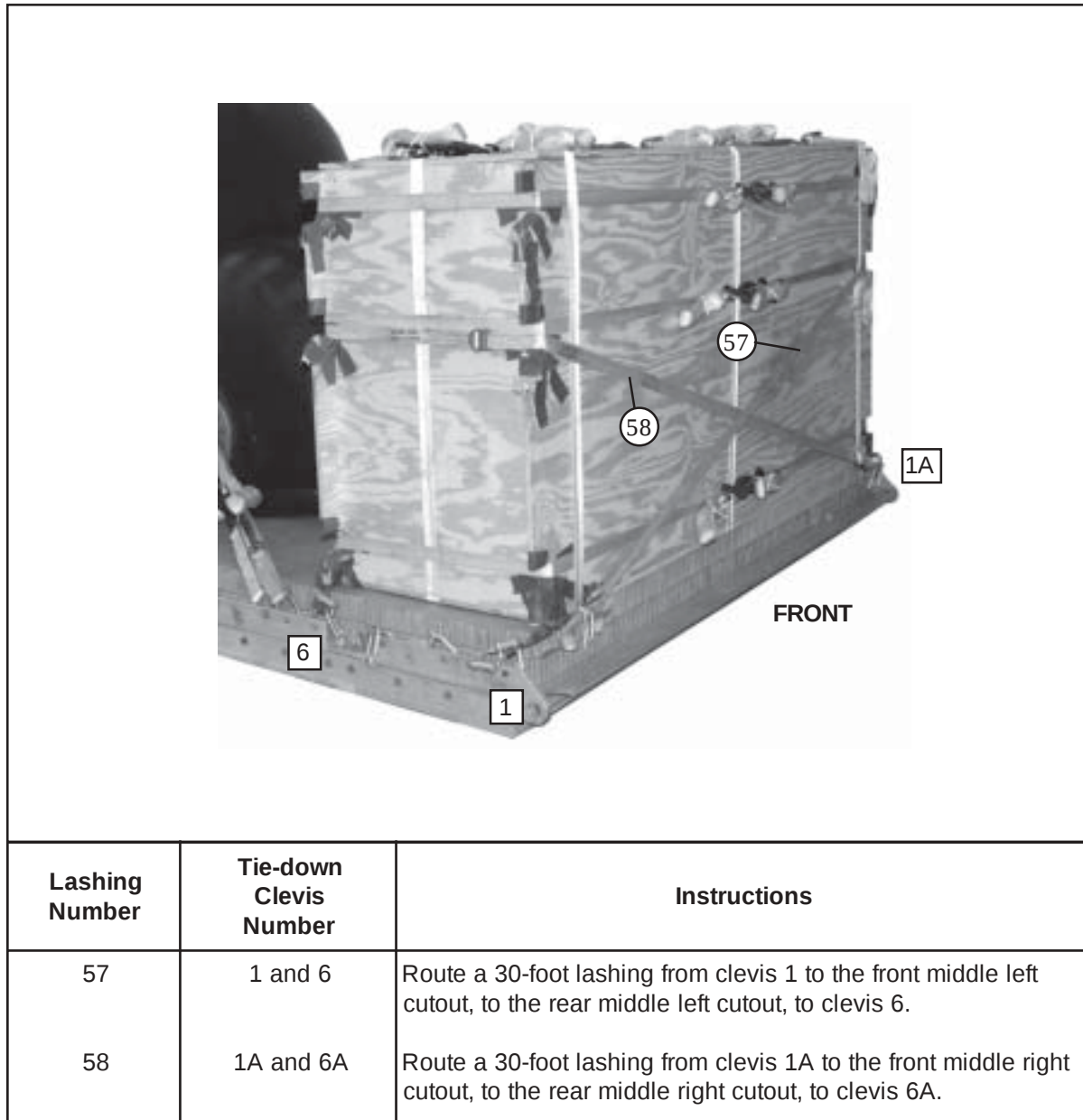
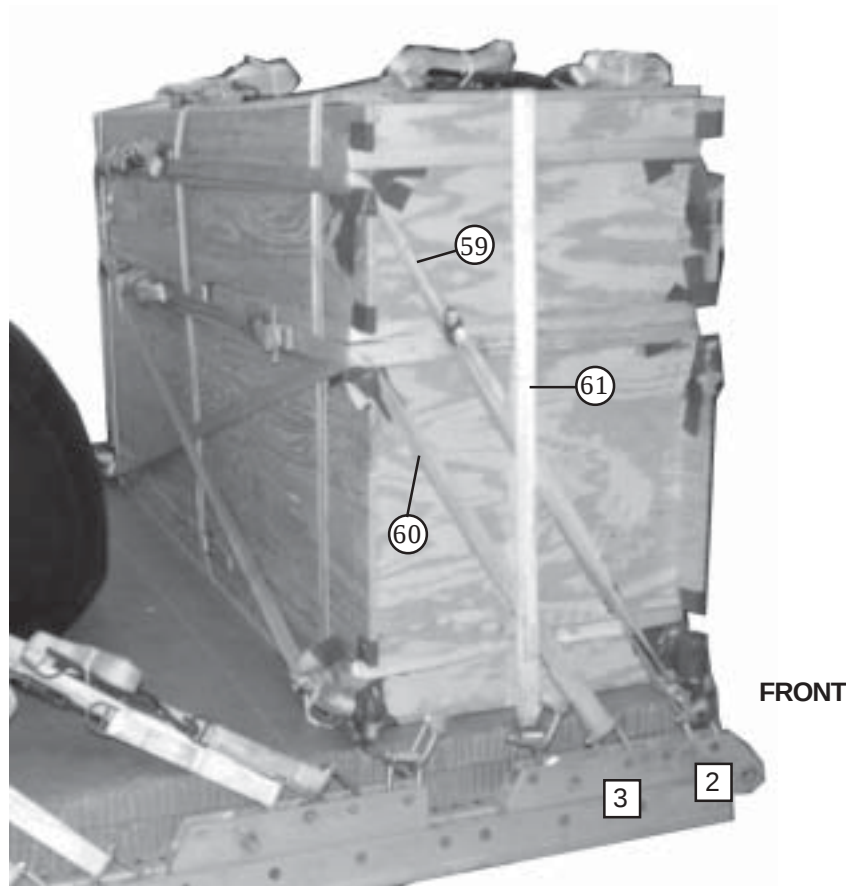
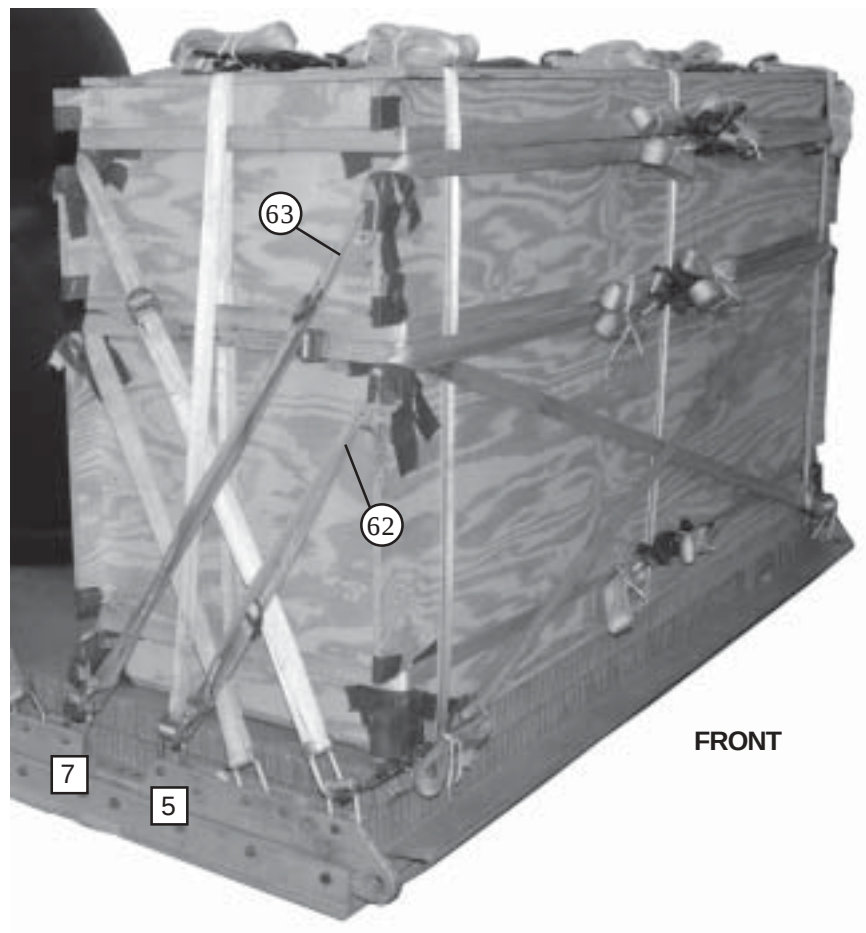


Figure 4-100. Lashings 57 and 58 Installed



Lashing Number	Tie-down Clevis Number	Instructions
59	2 and 2A	Route a 45-foot lashing through clevis 2 to the rear top right cutout, to the rear top left cutout, through clevis 2A and load bind on the rear of the box.
60	3 and 3A	Route a 45-foot lashing through clevis 3 to the rear middle right cutout, to the rear middle left cutout, through clevis 3A and load bind on the rear of the box.
61	4 and 4A	Route a lashing through it's own D-ring on clevis 4, repeat on clevis 4A and load bind them together on top of the box.

Figure 4-101. Lashings 59 through 61 Installed



Lashing Number	Tie-down Clevis Number	Instructions
62	5 and 5A	Route a 45-foot lashing through clevis 5 to the front middle right cutout, to the front middle left cutout, through clevis 5A and load bind on the front of the box.
63	7 and 7A	Route a 45-foot lashing through clevis 7 to the front top right cutout, to the front top left cutout, through clevis 7A and load bind on the front of the box.

Figure 4-102. Lashings 62 and 63 Installed

b. Lash the rear equipment box to the platform as shown in Figures 4-103 through 4-105.

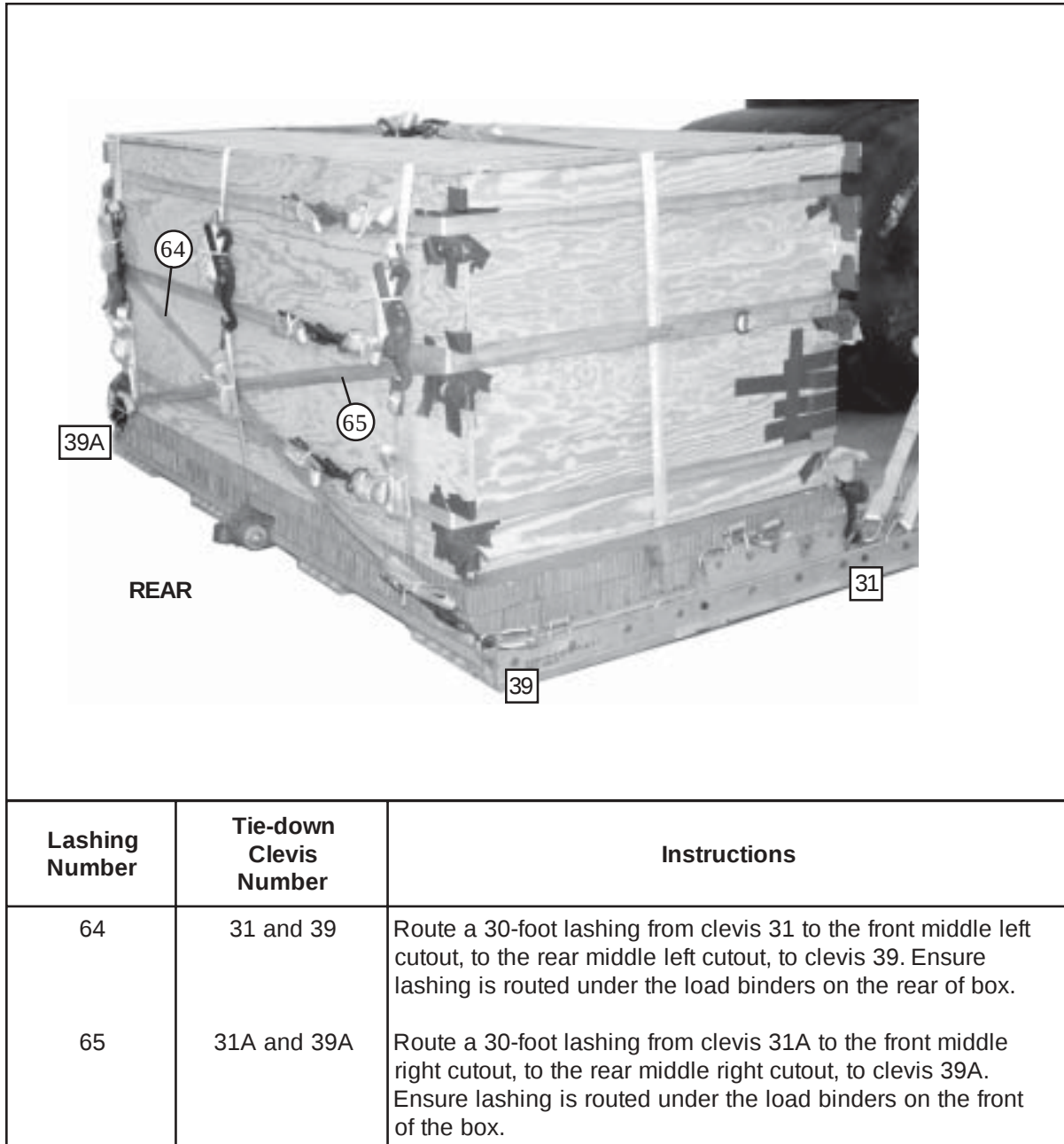


Figure 4-103. Lashings 64 and 65 Installed

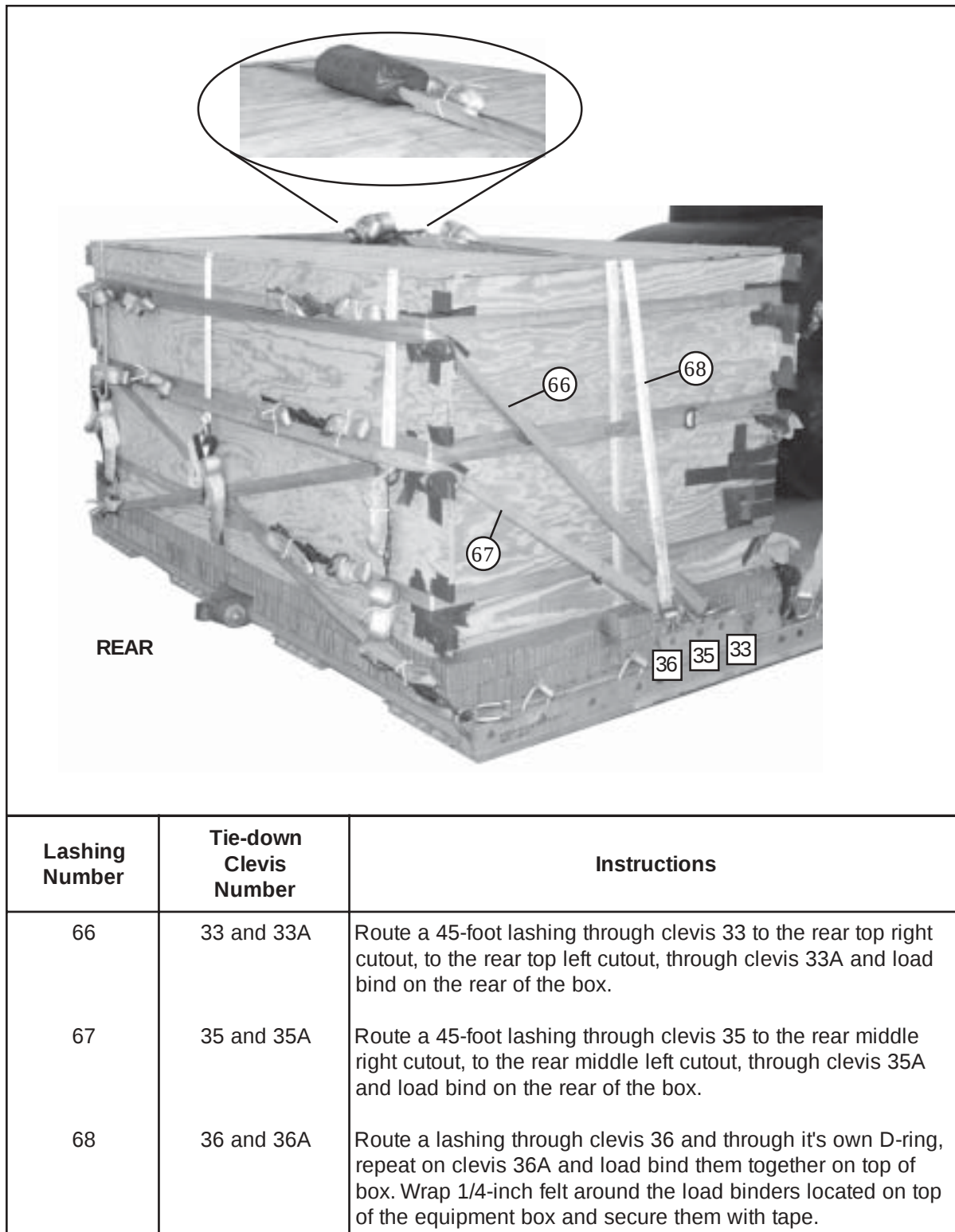
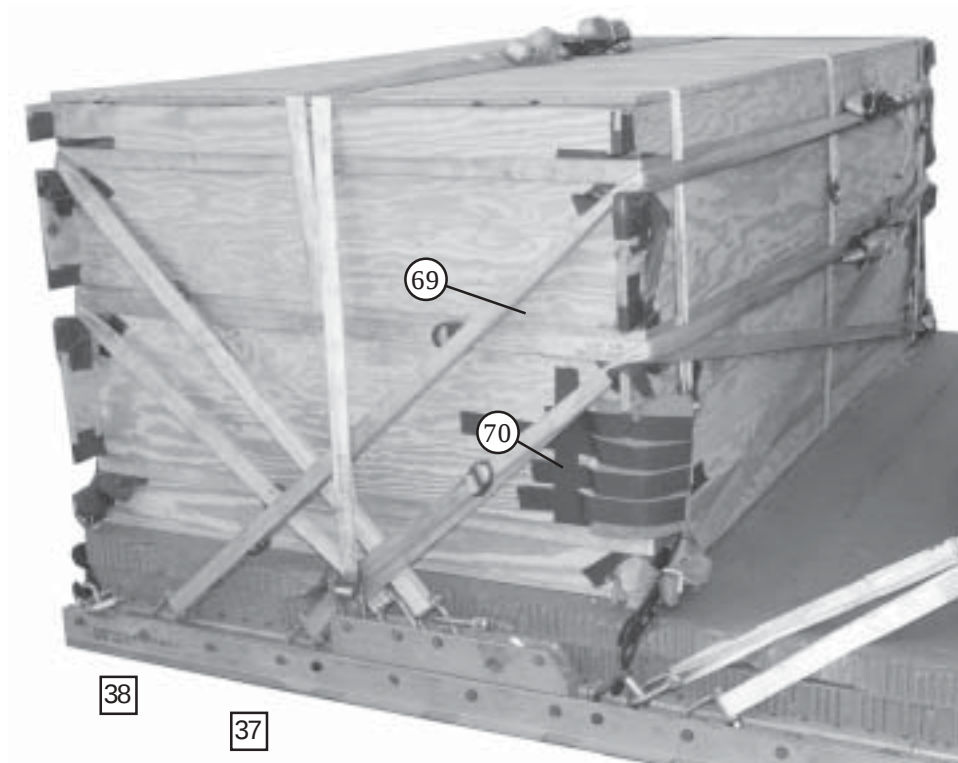


Figure 4-104. Lashings 66 through 68 Installed



Lashing Number	Tie-down Clevis Number	Instructions
69	37 and 37A	Route a 45-foot lashing through clevis 37 to the front middle right cutout, to the front middle left cutout, through clevis 37A and load bind on the front of the box.
70	38 and 38A	Route a 45-foot lashing through clevis 38 to the front top right cutout, to the front top left cutout, through clevis 38A and load bind on the front of the box.

Figure 4-105. Lashings 69 and 70 Installed

BUILDING AND POSITIONING RELEASE PLATFORM

4-66. Build and position the release platform as shown in Figure 4-106.

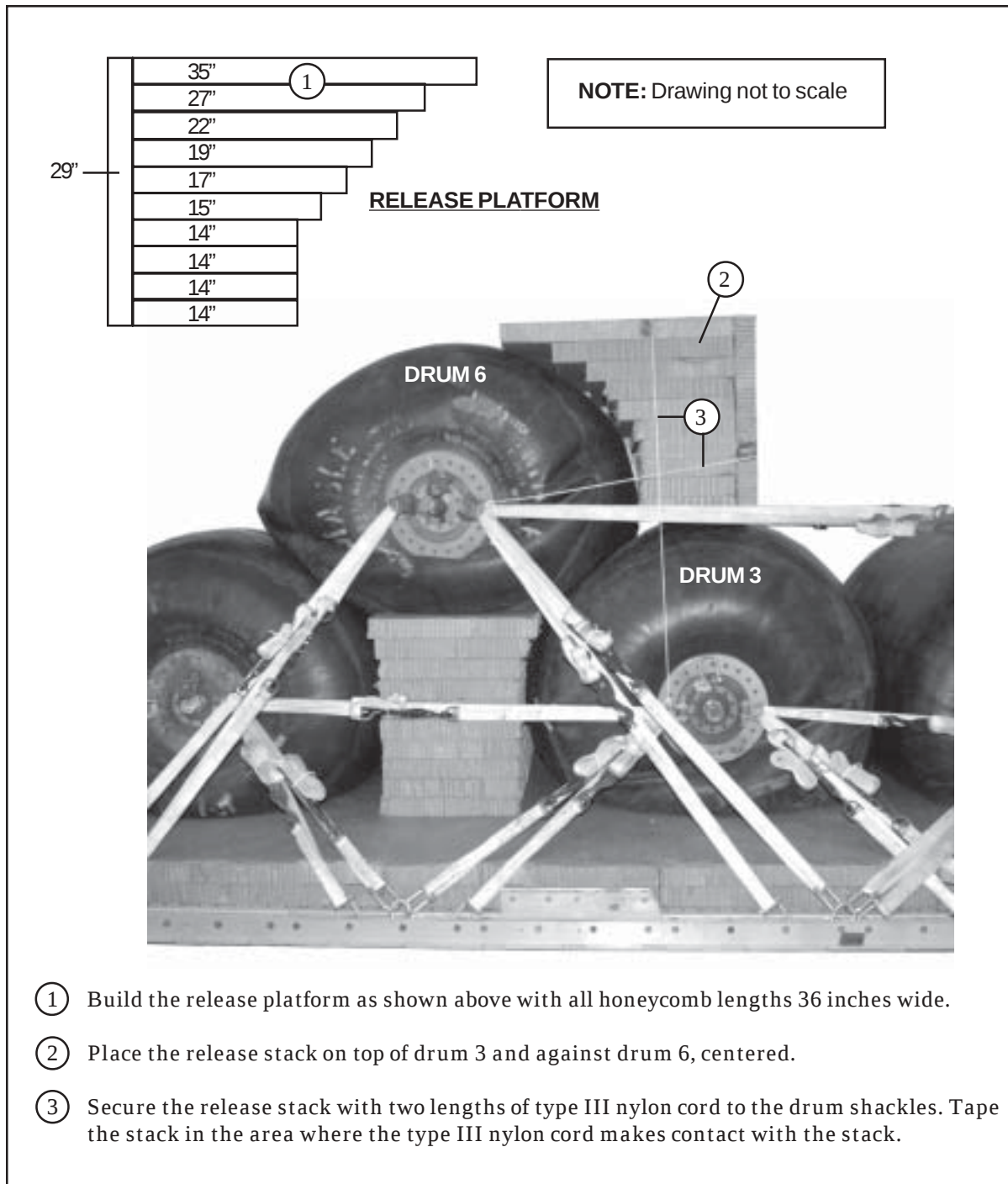


Figure 4-106. Release Platform Built and Positioned

INSTALLING SUSPENSION SLINGS AND SAFETY TIES

4-67. Install suspension slings and safety ties as shown in Figure 4-107.

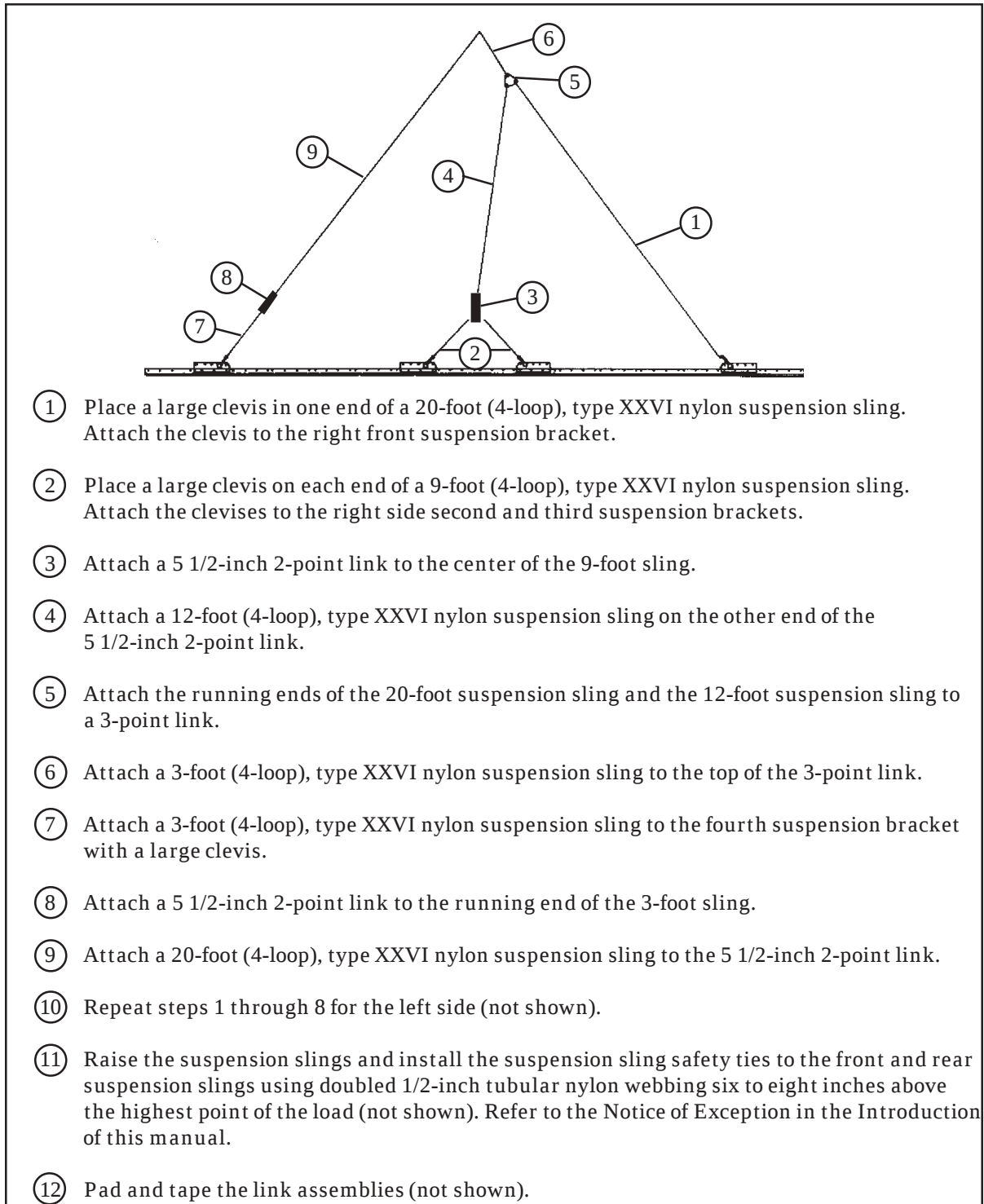
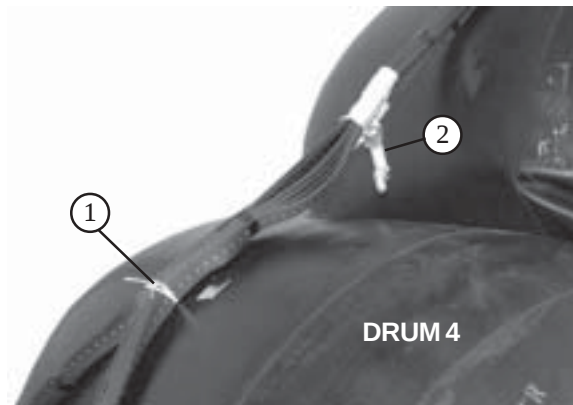


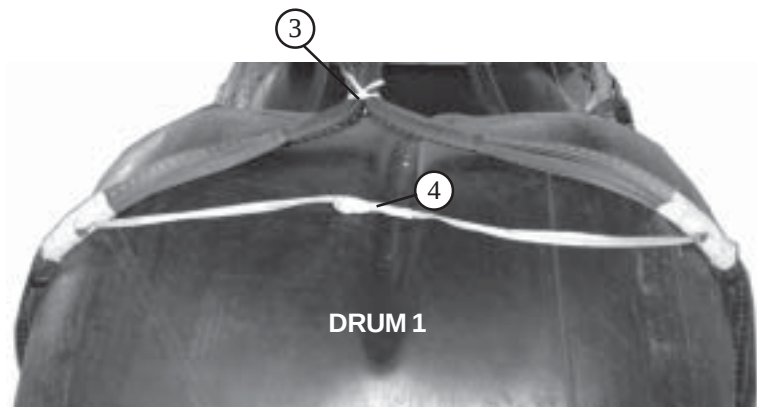
Figure 4-107. Suspension Slings and Safety Ties Installed

SECURING THE SUSPENSION SLINGS

4-68. Make the following suspension slings securing ties as shown in Figure 4-108.

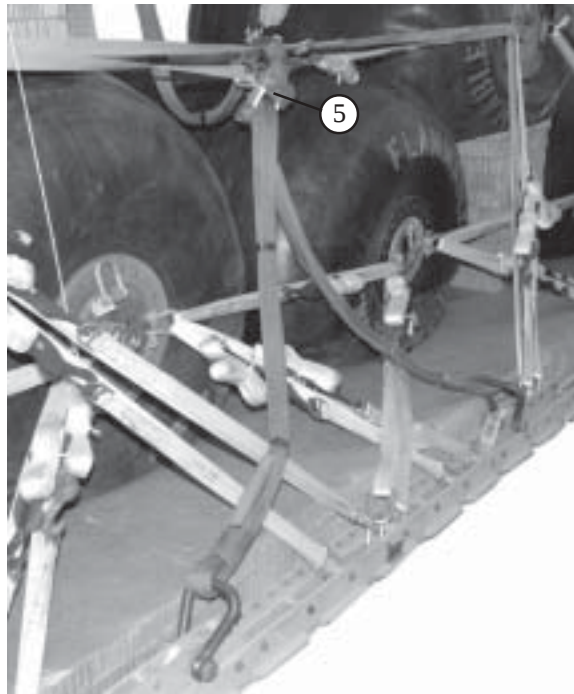


- ① Lower the suspension slings to the point where the front and rear suspension slings can lay on top of the drums and touch in the middle. Bring the rear suspension slings together on top of drum 4. Secure the slings together with one turn doubled 1/4-inch cotton webbing.
- ② S-fold and tape the excess safety tie with masking tape.

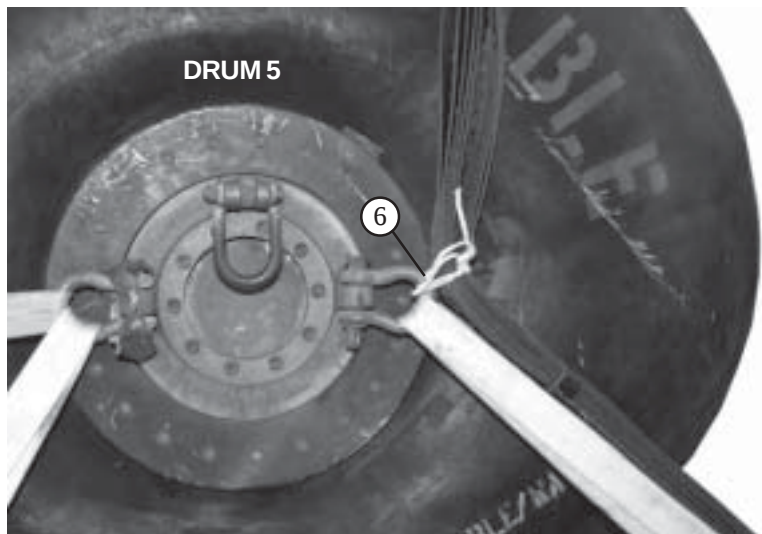


- ③ Bring the front suspension slings together on top of drum 1. Secure the slings together with one turn doubled 1/4-inch cotton webbing.
- ④ S-fold and tape the excess safety tie with masking tape.

Figure 4-108. Suspension Slings Secured

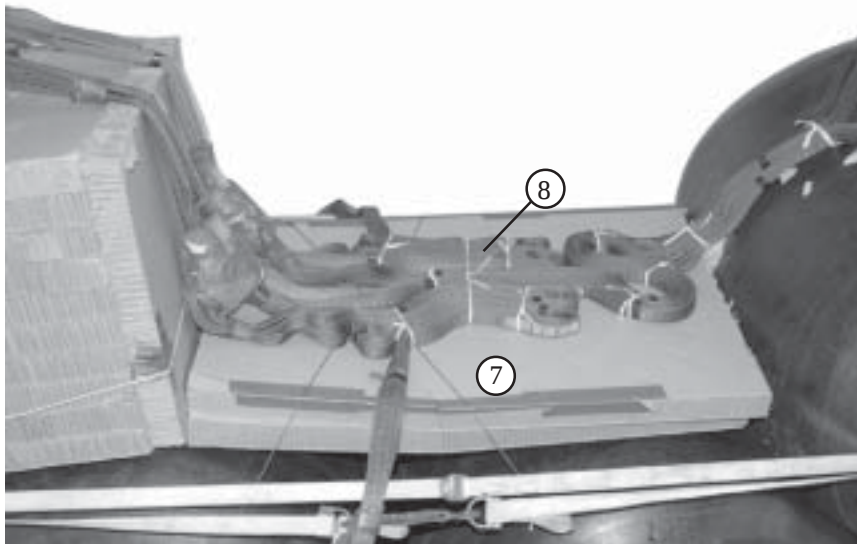


- ⑤ Secure the middle suspension sling and 5 1/2-inch 2-point link on the right and left sides to the top lateral lashing D-rings with one turn doubled 1/4-inch cotton webbing.

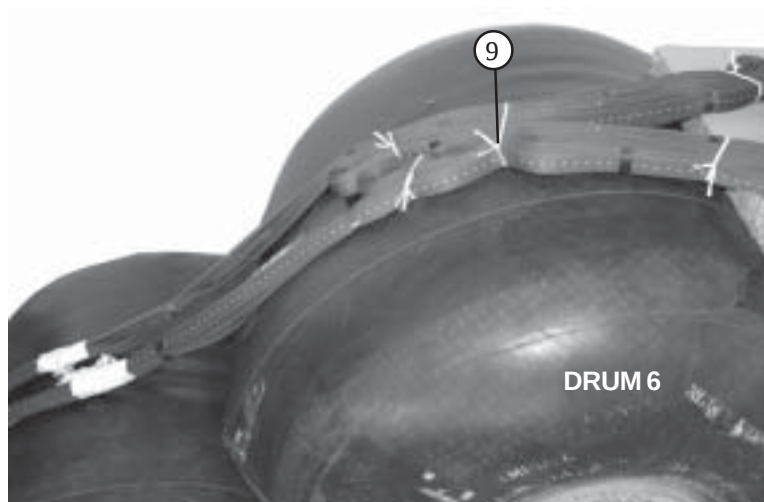


- ⑥ Secure the front suspension slings to the right and left front shackles of drum 5 with one turn doubled 1/4-inch cotton webbing.

Figure 4-108. Suspension Slings Secured (Continued)



- ⑦ Place two 56-inch by 36-inch pieces of honeycomb on top of drums 3 and 4 against the front base of the release platform. Tape the top right and left sides and secure to a convenient point on the load with type III nylon cord.
- ⑧ Lower the suspension slings. S-fold and secure the front suspension slings on the 56-inch by 36-inch piece of honeycomb with one turn single 1/4-inch cotton webbing. Make one tie around both sets of front suspension slings to hold them together with one turn single 1/4-inch cotton webbing.



- ⑨ S-fold the rear suspension slings on top of drum 6 and secure with one turn single 1/4-inch cotton webbing. Make one tie around both sets of rear suspension slings to hold them together with one turn single 1/4-inch cotton webbing.

Figure 4-108. Suspension Slings Secured (Continued)

PREPARING AND STOWING CARGO PARACHUTES

4-69. Prepare and stow seven G-11 cargo parachutes as shown in Figure 4-109.

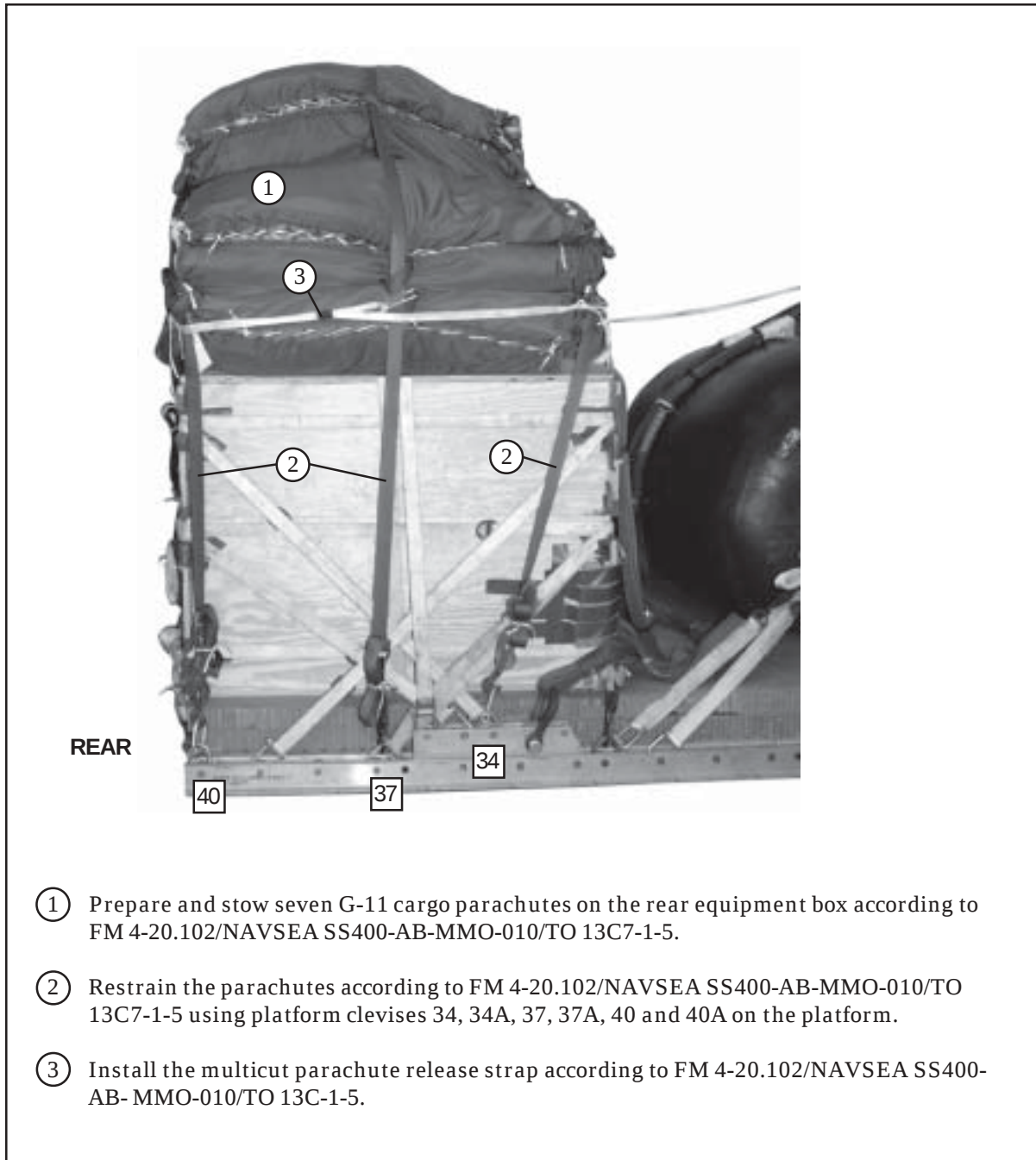


Figure 4-109. Cargo Parachutes Prepared and Stowed

INSTALLING THE EXTRACTION SYSTEM

4-70. Install the extraction system as shown in Figure 4-110.

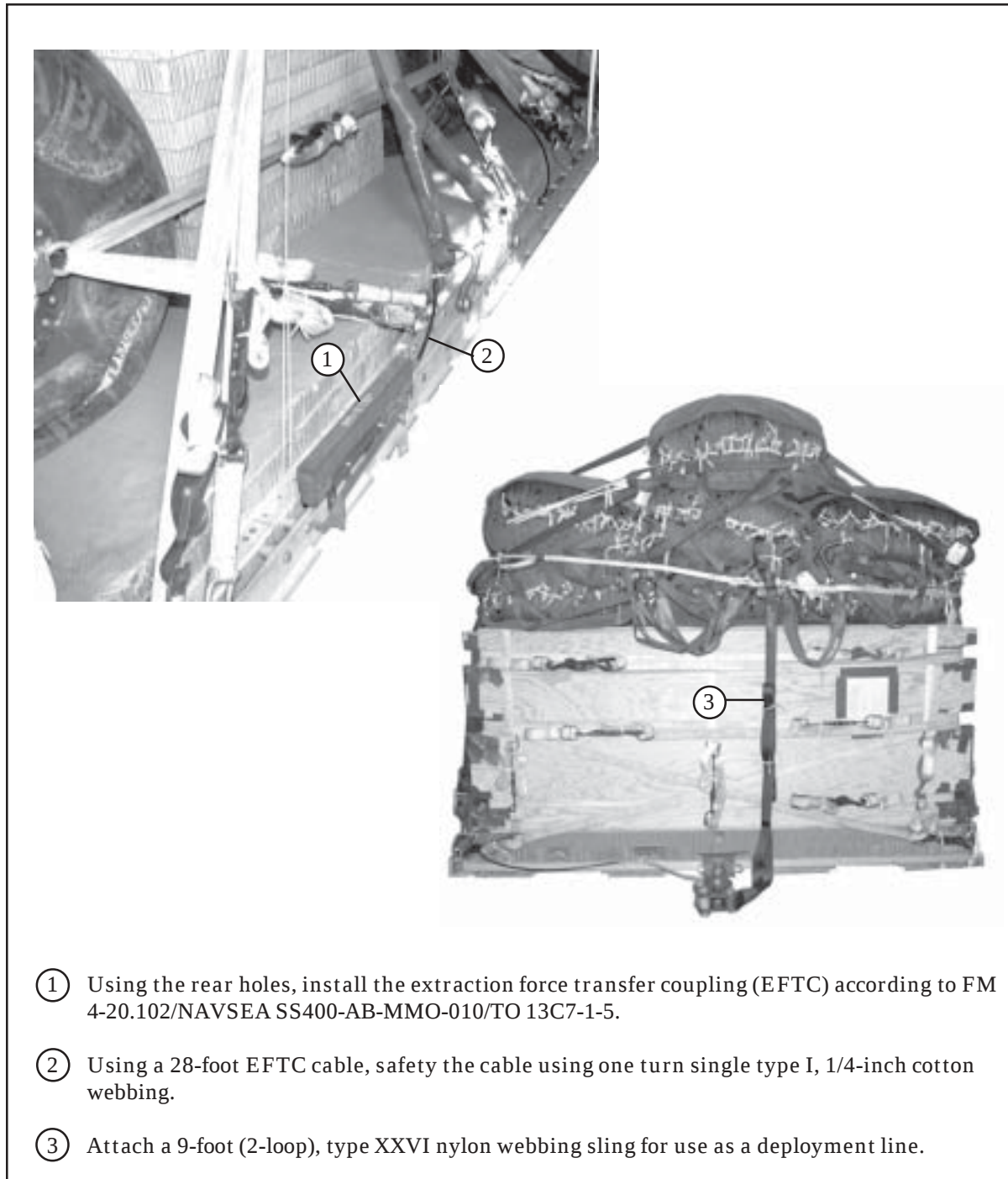
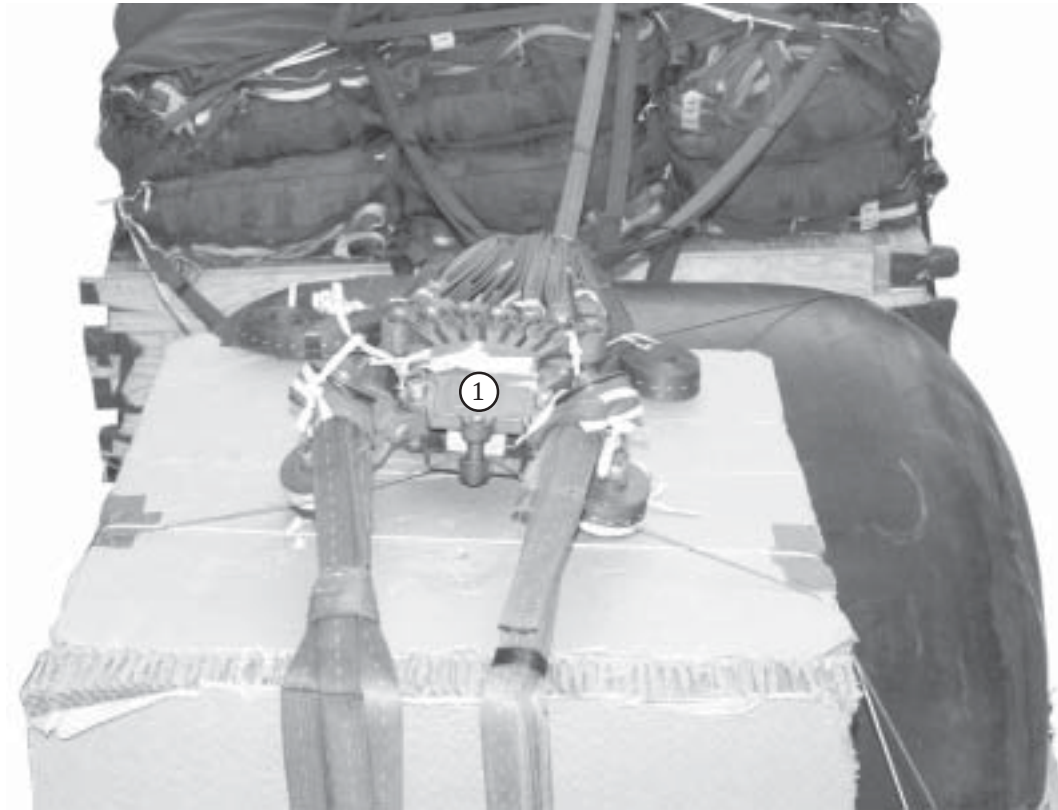


Figure 4-110. Extraction System Installed

INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-71. Install the M-2 cargo parachute release system as shown in Figure 4-111.



- ① Place the M-2 release on the release platform. Attach the suspension slings and the parachute riser extensions to the M-2 cargo parachute release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.

Figure 4-111. Cargo Parachute Release Installed

PLACING EXTRACTION PARACHUTE

4-72. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

4-73. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

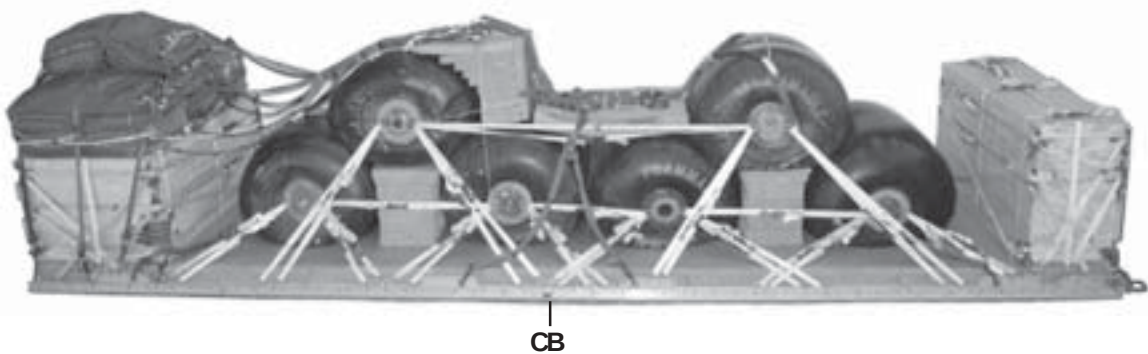
4-74. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-112. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

4-75. Use the equipment list in Table 4-5 to rig the load shown in Figure 4-112.

CAUTION

Make the final inspection required by FM 4-20.102/NAVSEA
SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves
the rigging site.

**RIGGED LOAD DATA**

Weight 32,480 pounds

NOTE: The rigged weight for this load is using water as the liquid. Use the weight conversion table for the actual rigged weight for any other liquids used.

NOTE: The G-11 requirements may need to be recomputed for lighter liquids.

Maximum Weight 34,000 pounds

Height 94 inches

Width 108 inches

Overall Length 402 inches

Overhang: Front 0 inches

Rear (EFTC) 18 inches

Center of Balance (CB) (from front edge of platform) 195 inches

Figure 4-112. AAFARS Rigged with Six 500-Gallon Drums for Low-Velocity Airdrop

Table 4-5. Equipment Required for Rigging AAFARS With Six 500-Gallon Drums

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	12
4030-00-678-8562	Clevis, medium	6
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-326-7309	Coupling assembly, airdrop, extraction force transfer w/ cable, 28-ft	1
1670-00-360-0328	Cover, clevis, large	7
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, parachute bag (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add1 for DES)	2
1670-01-064-4452	Line, drogue (for DES) 60-foot (1-loop), type XXVI	1
1670-01-064-4454	Line, extraction For C-130: 60-ft (6-loop), type XXVI	1
1670-01-062-6312	For C-141: 120-ft (6-loop), type XXVI	1
1670-01-062-6312	For C5: (between fuselage station 1667-1971) 120-ft (6-loop), type XXVI	1
1670-01-062-6312	(between fuselage station 947-1666) 120-ft (6-loop), type XXVI and a	1
1670-01-064-4454	60-ft (6-loop), type XXVI	1
1670-01-062-6312	(between fuselage station 574-947) 120-ft (6-loop), type XXVI	2
1670-01-468-9178	For C-17: 140-ft (6-loop), type XXVI	
5306-00-435-8994	Link assembly: Two-point: (for DES) Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2

Table 4-5. Equipment Required for Rigging AAFARS With Six 500-Gallon Drums (Continued)

National Stock Number	Item	Quantity
5306-00-435-8994	Two-point: Bolt, 1-in diam, 4-in long	10
5310-00-232-5165	Nut, 1-in, hexagonal	10
1670-00-003-3454	Plate, side, 5 1/2-in	10
5365-00-007-3414	Spacer, large	10
1670-01-307-1055	Link assembly: Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17	1
5510-00-220-6146	Lumber: 2- by 4-in	As required
5510-00-220-6148	2- by 6-in	As required
5315-00-010-4659	Nail, steel wire, common, 8d	As required
5315-00-010-4662	12d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	37 sheets
1670-01-016-7841	Parachute: Cargo: G-11C	7
1670-00-040-8135	Cargo extraction: 28-foot	2
1670-01-063-3715	Drogue: (for DES) 15-ft	1
1670-01-353-8425	Platform, airdrop, Type V, 32-foot	1
1670-01-162-2376	Bracket assembly, EFTC	1
1670-01-162-2372	Bracket assembly, extraction	84
1670-01-247-2389	Clevis assembly	8
1670-01-162-2381	Bracket, suspension	2
5530-00-128-4981	Tandem link assembly (multipurpose link)	11 sheets
1670-01-097-8817	Plywood, 3/4-in	1
1670-01-062-6306	Release, cargo parachute, M-2	
1670-01-062-6305	Sling, cargo, airdrop	
1670-01-062-6307	For suspension:	
1670-01-064-4453	3-ft (4-loop), type XXVI nylon webbing	4
	9-ft (4-loop), type XXVI nylon webbing	2
	12-ft (4-loop), type XXVI nylon webbing	2
	20-ft (4-loop), type XXVI nylon webbing	4

Table 4-5. Equipment Required for Rigging AAFARS With Six 500-Gallon Drums (Continued)

National Stock Number	Item	Quantity
1670-01-062-6304	For deployment: 9-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-6311	For riser extension: 120-ft (2-loop), type XXVI	7
5340-00-040-8219	Strap, parachute release, multicut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	118
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-260-6890	Type X	As required

SECTION V- RIGGING AAFARS WITH SEVEN 500-GALLON FUEL DRUMS

DESCRIPTION OF LOAD

4-76. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 32-foot type, V platform with seven G-11 cargo parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum of 55 GPM. There are six collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The total rigged overall length is 402 inches. Width is 108 inches. Height is 96 inches. Center of balance is 192 inches.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
 2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
 3. Do not pressurize drums with air.

PREPARING PLATFORM

4-77. Prepare a 32-foot type V airdrop platform using two tandem links, eight suspension brackets and 92 tie-down clevises as shown in Figure 4-113.

- Notes:**
1. The nose bumper may or may not be installed.
 2. Measurements given in this section are from the front edge of the platform, NOT from the front edge of the nose bumper.

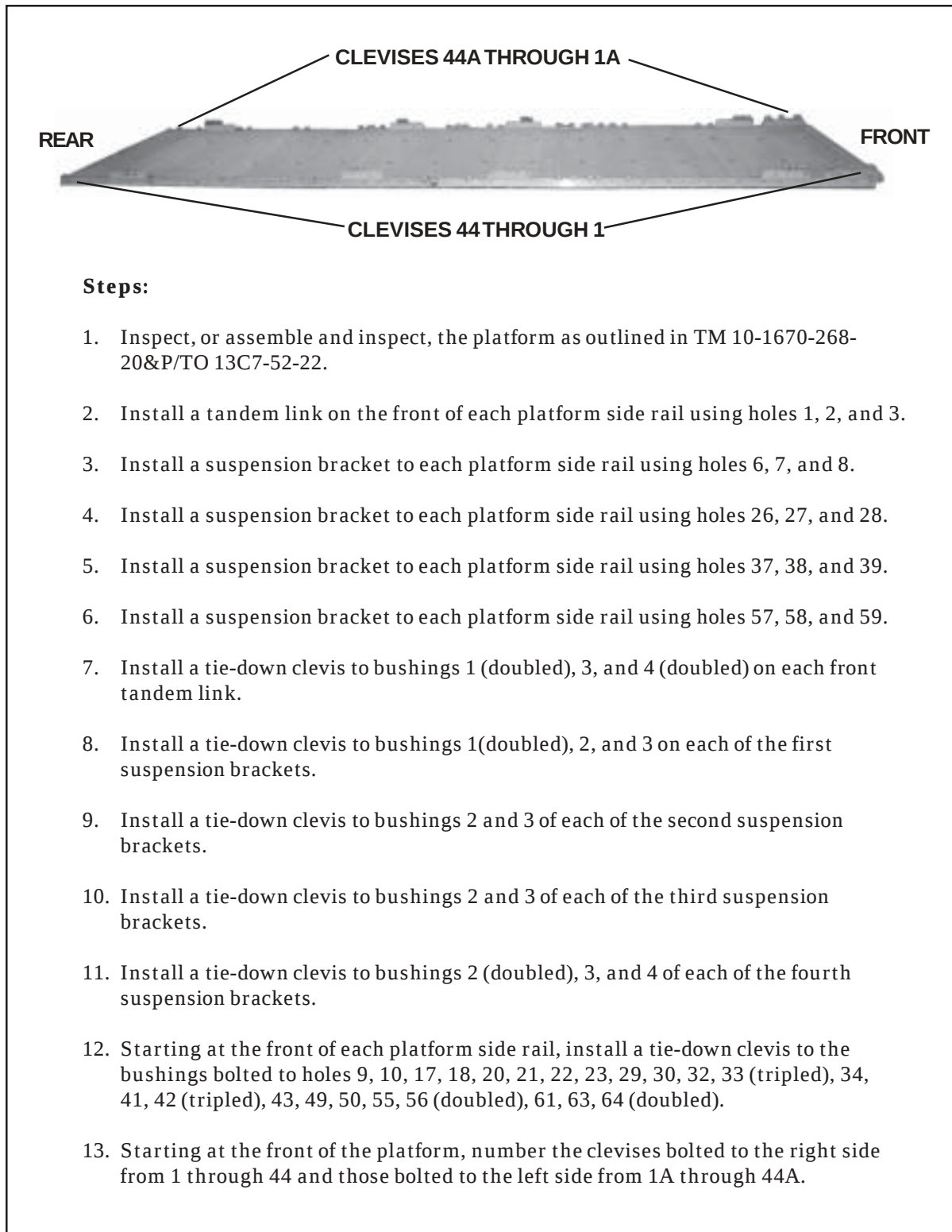


Figure 4-113. Platform Prepared

PREPARING HONEYCOMB

4-78. Prepare and build honeycomb stacks as shown in Figure 4-114.

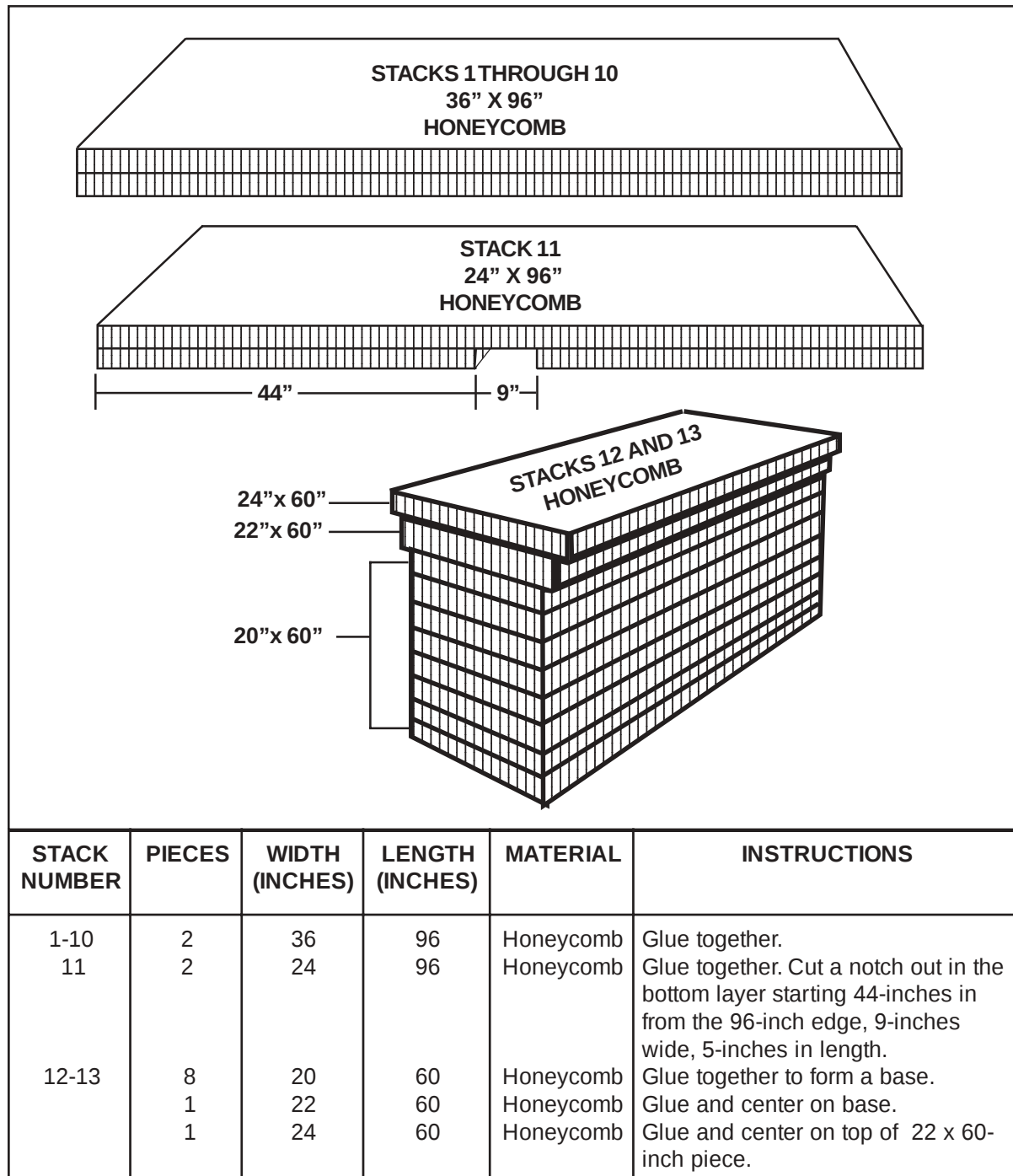


Figure 4-114. Honeycomb Stacks Prepared

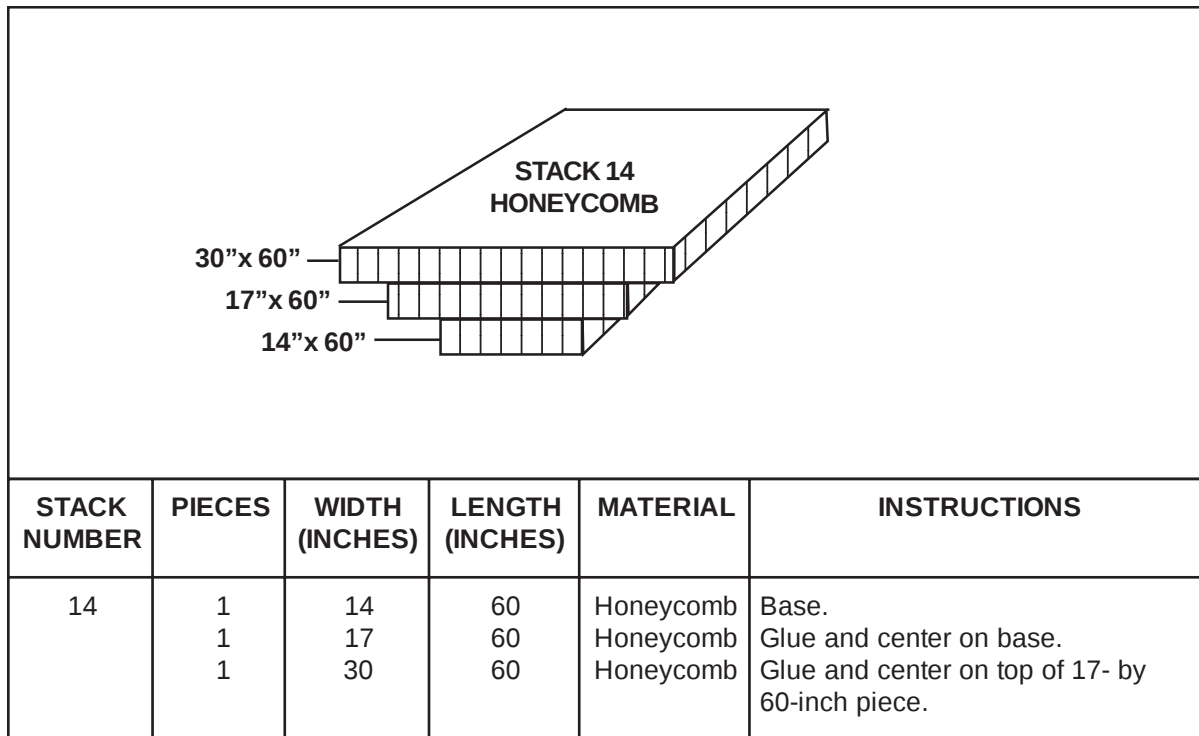


Figure 4-114. Honeycomb Stacks Prepared (Continued)

POSITIONING HONEYCOMB STACKS

4-79. Position honeycomb stacks 1 through 11 as shown in Figure 4-115.

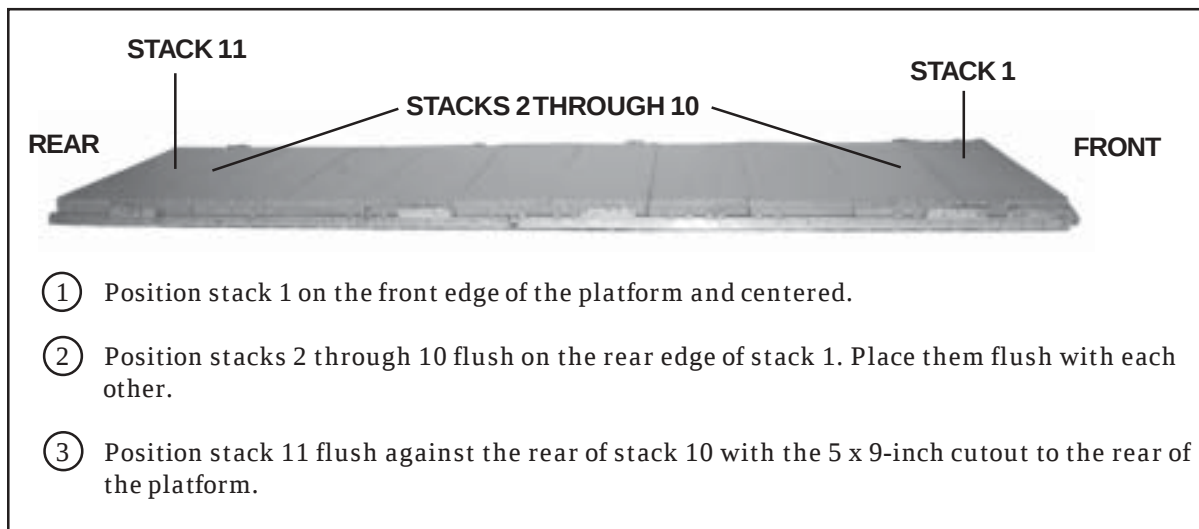


Figure 4-115. Positioning Honeycomb Stacks 1 through 11 Positioned

POSITIONING AND LASHING THE DRUMS

4-80. Position and lash the drums to the platform as shown in Figures 4-116 through 4-128.

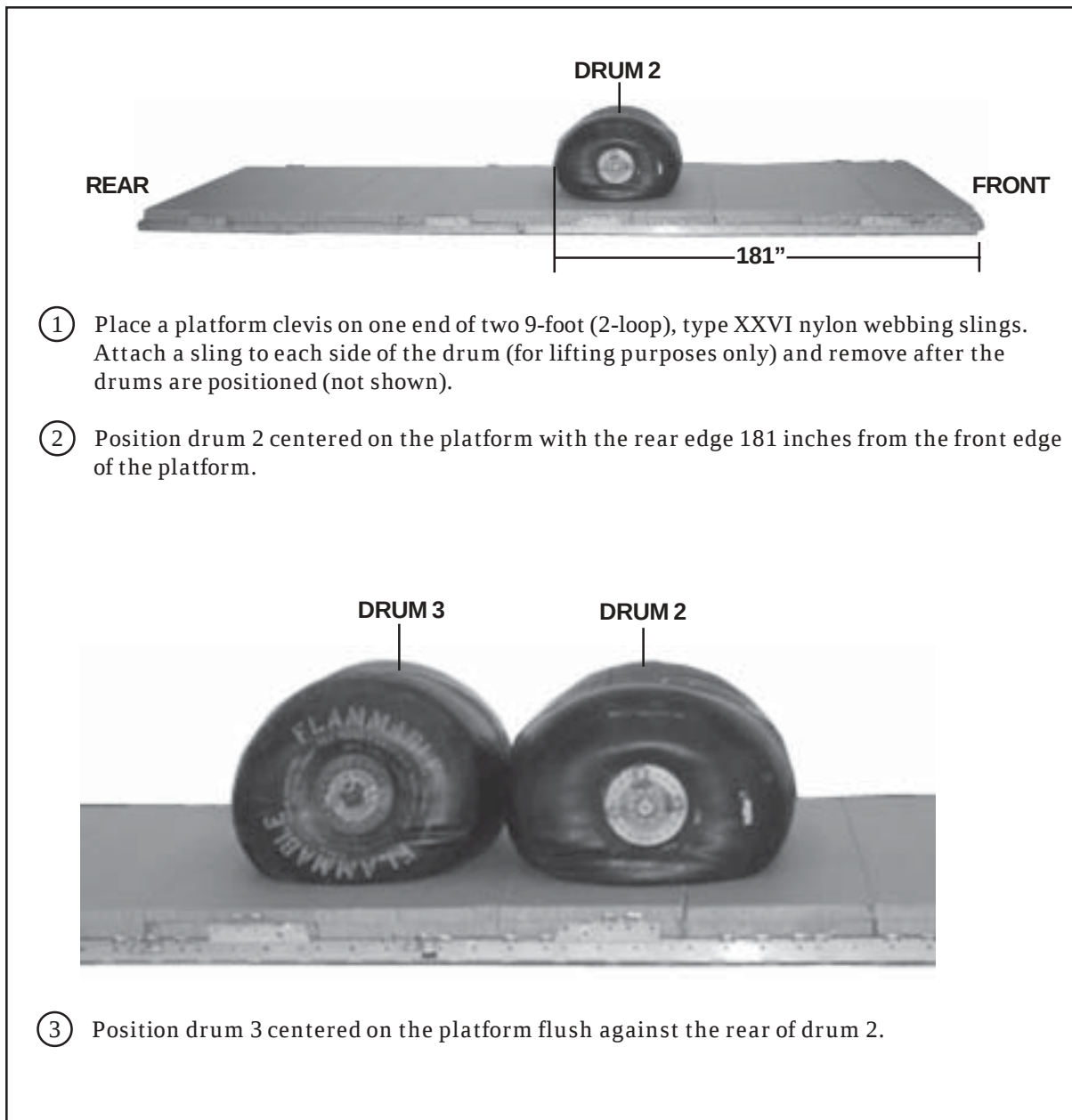


Figure 4-116. Fuel Drums 2 and 3 Positioned

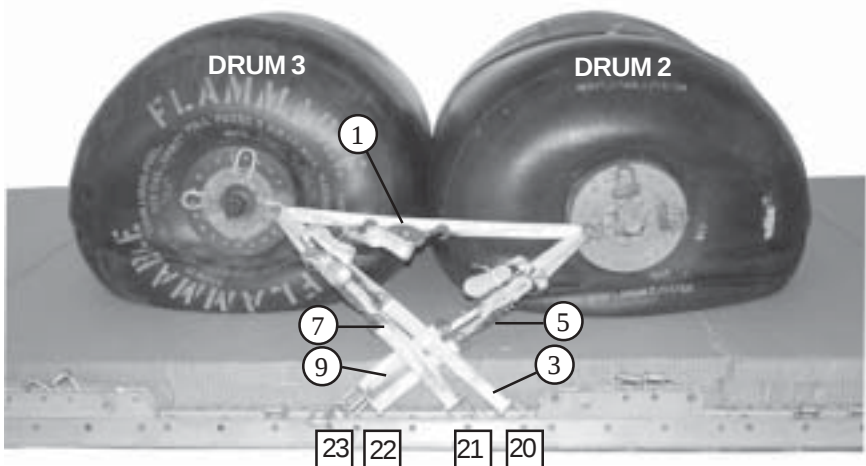
		
Lashing Number	Tie-down Clevis Number	Instructions
1		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the right side.
2		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the left side.
3	20	Route a lashing from clevis 20 to the front right shackle on drum 3.
4	20A	Route a lashing from clevis 20A to the front left shackle on drum 3.
5	22	Route a lashing from clevis 22 to the rear right shackle on drum 2.
6	22A	Route a lashing from clevis 22A to the rear left shackle on drum 2.
7	21	Route a lashing from clevis 21 to the front right shackle on drum 3.
8	21A	Route a lashing from clevis 21A to the front left shackle on drum 3.
9	23	Route a lashing from clevis 23 to the rear right shackle on drum 2.
10	23A	Route a lashing from clevis 23A to the rear left shackle on drum 2.

Figure 4-117. Lashings 1 through 10 Installed

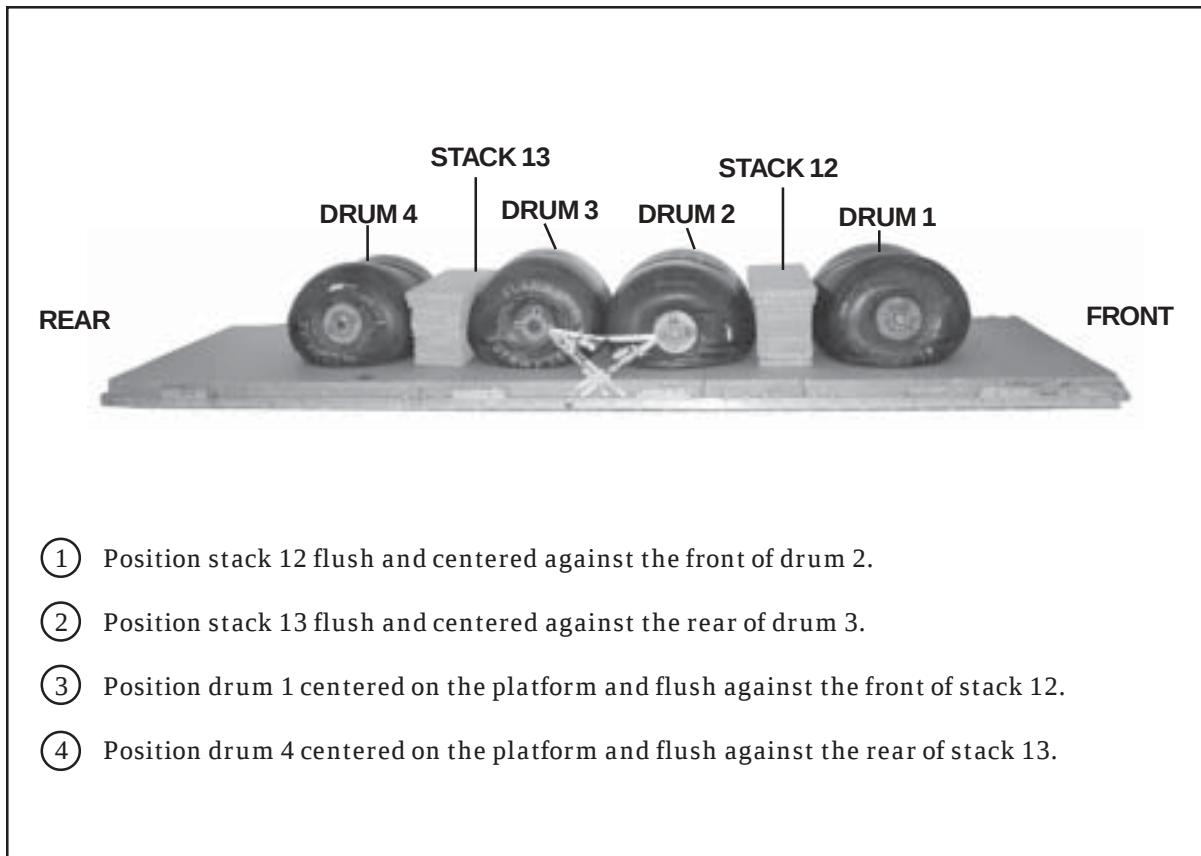


Figure 4-118. Fuel Drums 1 and 4 Positioned

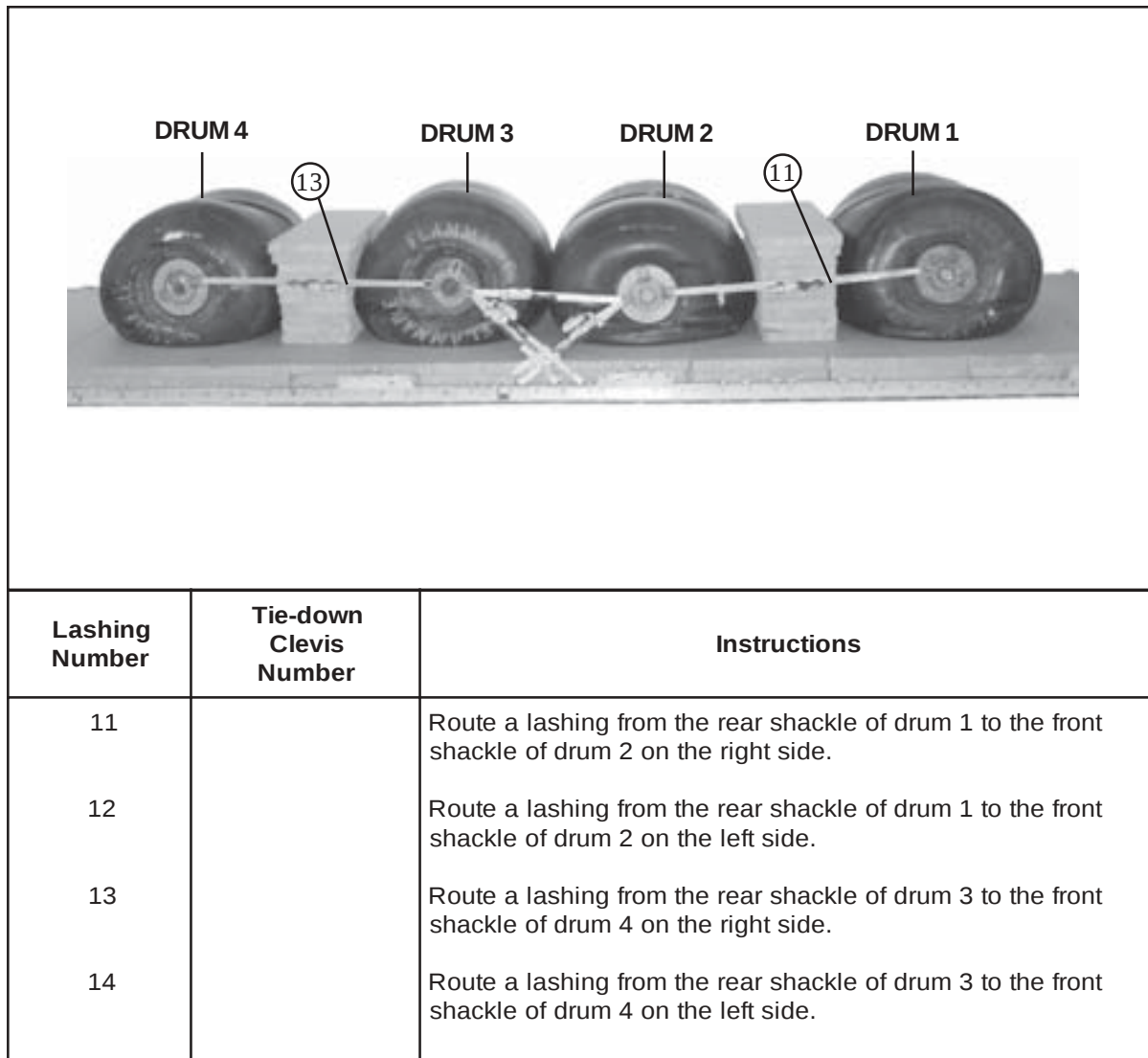


Figure 4-119. Lashings 11 through 14 Installed

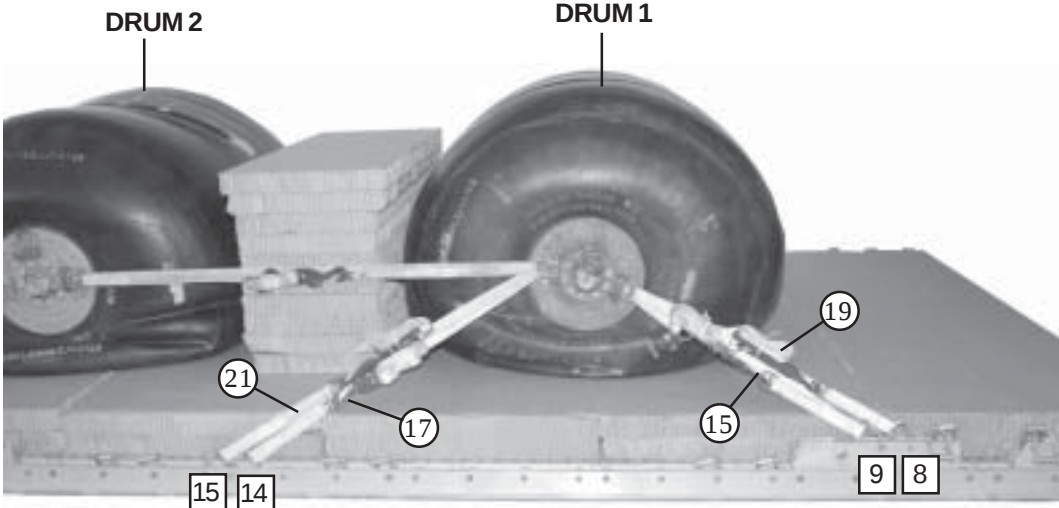
		
Lashing Number	Tie-down Clevis Number	Instructions
15	9	Route a lashing from clevis 9 to the front right shackle on drum 1.
16	9A	Route a lashing from clevis 9A to the front left shackle on drum 1.
17	14	Route a lashing from clevis 14 to the rear right shackle on drum 1.
18	14A	Route a lashing from clevis 14A to the rear left shackle on drum 1.
19	8	Route a lashing from clevis 8 to the front right shackle on drum 1.
20	8A	Route a lashing from clevis 8A to the front left shackle on drum 1.
21	15	Route a lashing from clevis 15 to the rear right shackle on drum 1.
22	15A	Route a lashing from clevis 15A to the rear left shackle on drum 1.

Figure 4-120. Lashings 15 through 22 Installed

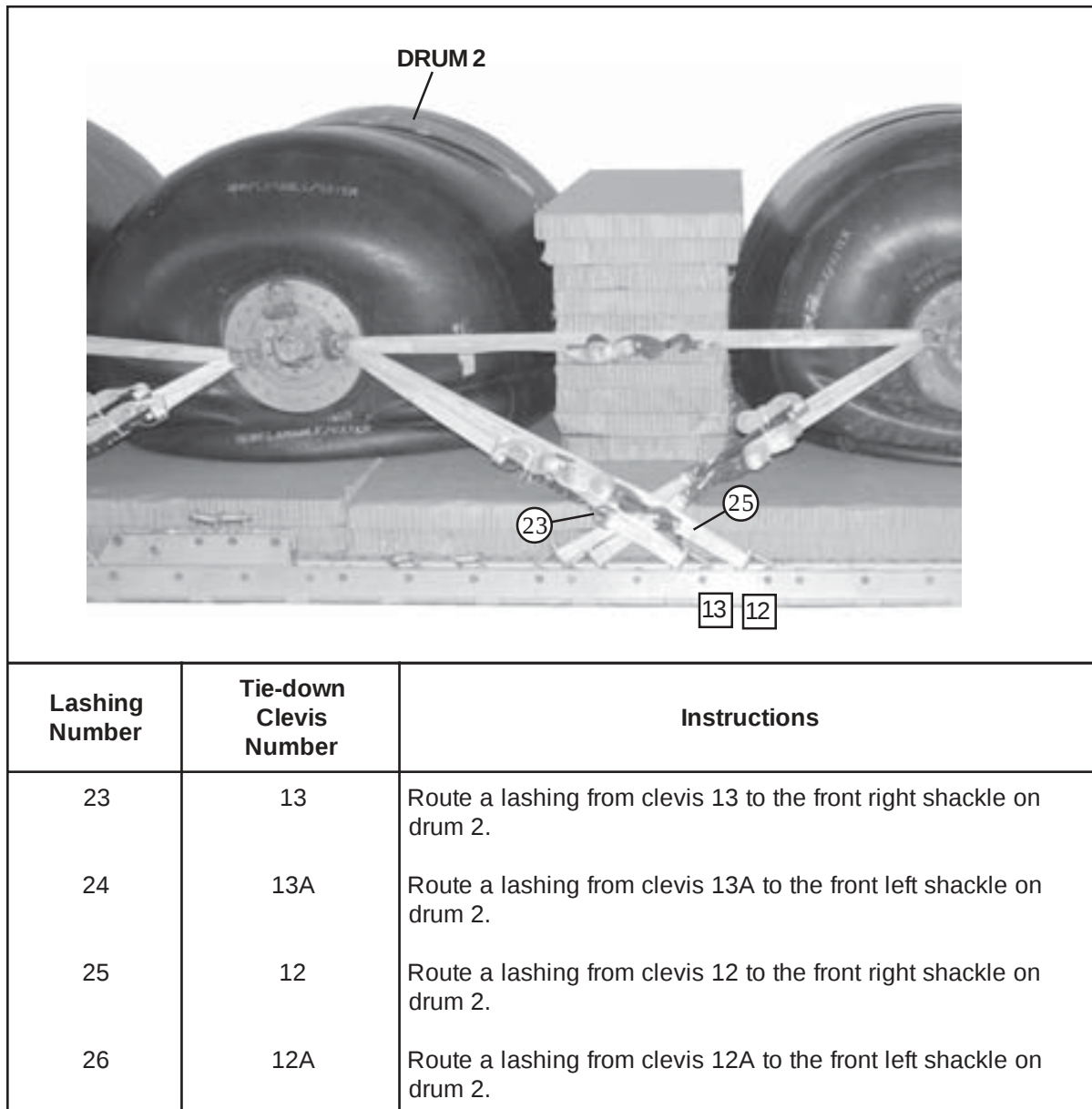


Figure 4-121. Lashings 23 through 26 Installed

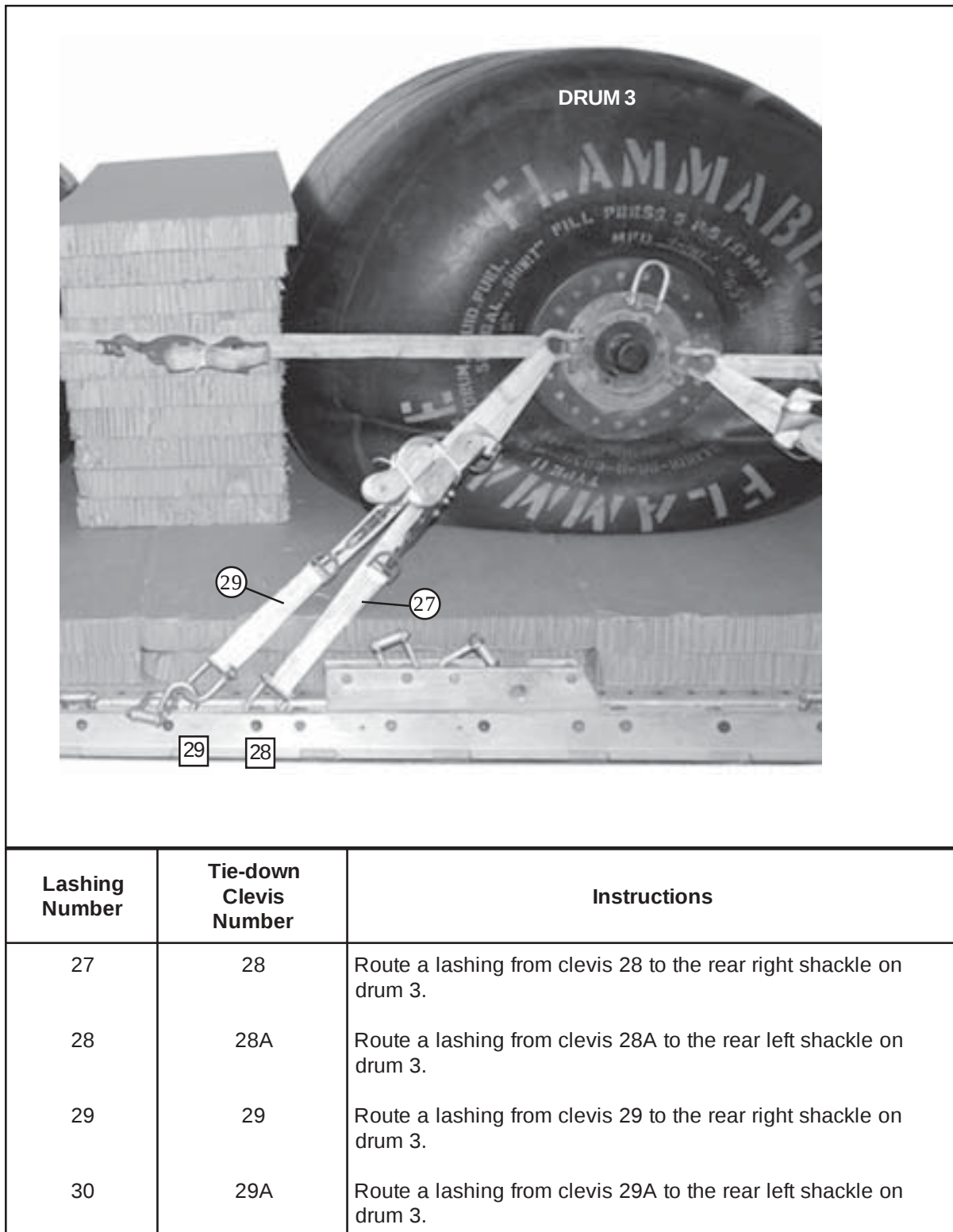


Figure 4-122. Lashings 27 through 30 Installed

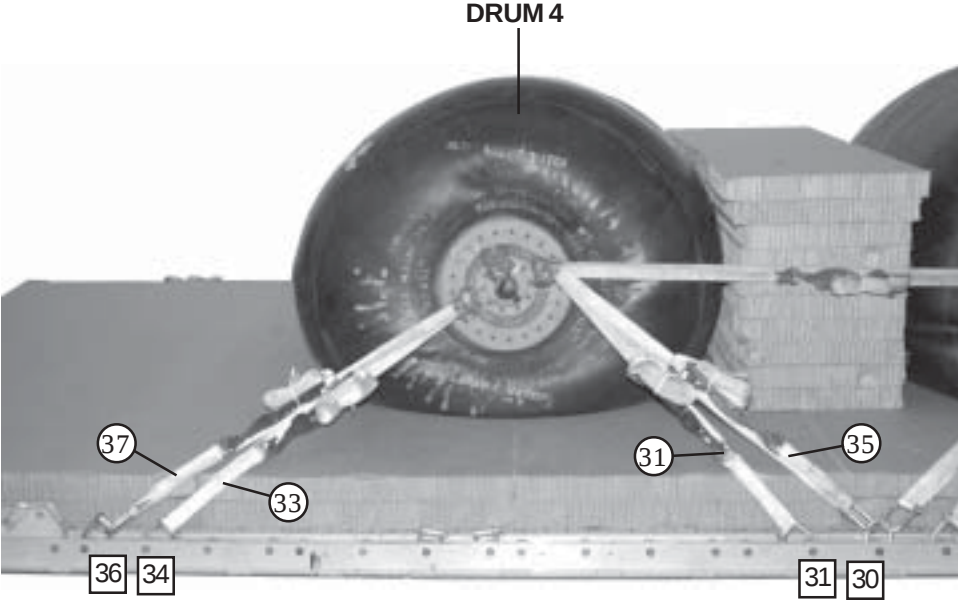
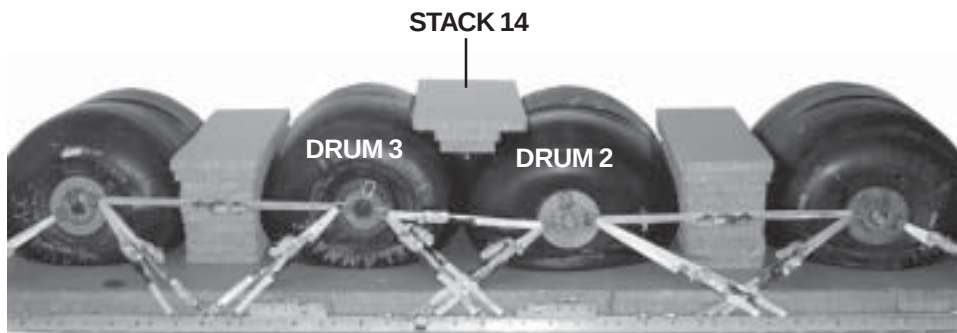
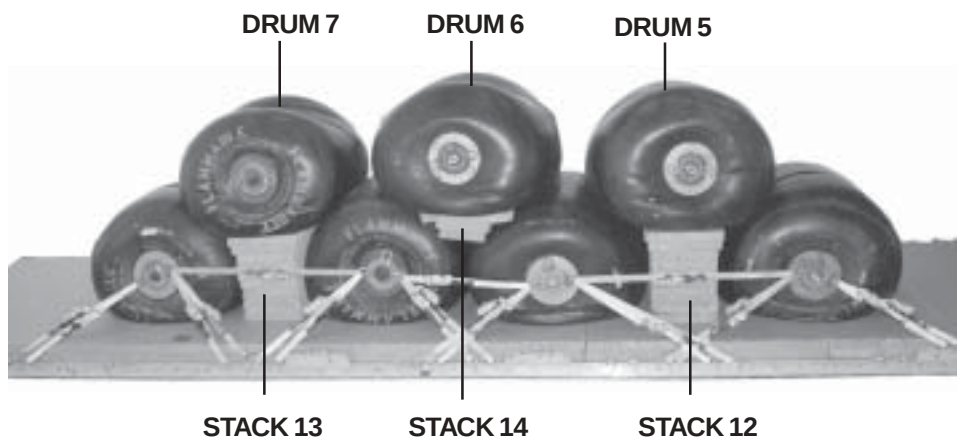
		
Lashing Number	Tie-down Clevis Number	Instructions
31	31	Route a lashing from clevis 31 to the front right shackle on drum 4.
32	31A	Route a lashing from clevis 31A to the front left shackle on drum 4.
33	34	Route a lashing from clevis 34 to the rear right shackle on drum 4.
34	34A	Route a lashing from clevis 34A to the rear left shackle on drum 4.
35	30	Route a lashing from clevis 30 to the front right shackle on drum 4.
36	30A	Route a lashing from clevis 30A to the front left shackle on drum 4.
37	36	Route a lashing from clevis 36 to the rear right shackle on drum 4.
38	36A	Route a lashing from clevis 36A to the rear left shackle on drum 4.

Figure 4-123. Lashings 31 through 38 Installed



- ① Position stack 14 on top and centered between drums 2 and 3.



- ② Position drum 5 centered on stack 12.
- ③ Position drum 6 centered on stack 14.
- ④ Position drum 7 centered on stack 13.

Figure 4-124. Fuel Drums 5 through 7 Positioned

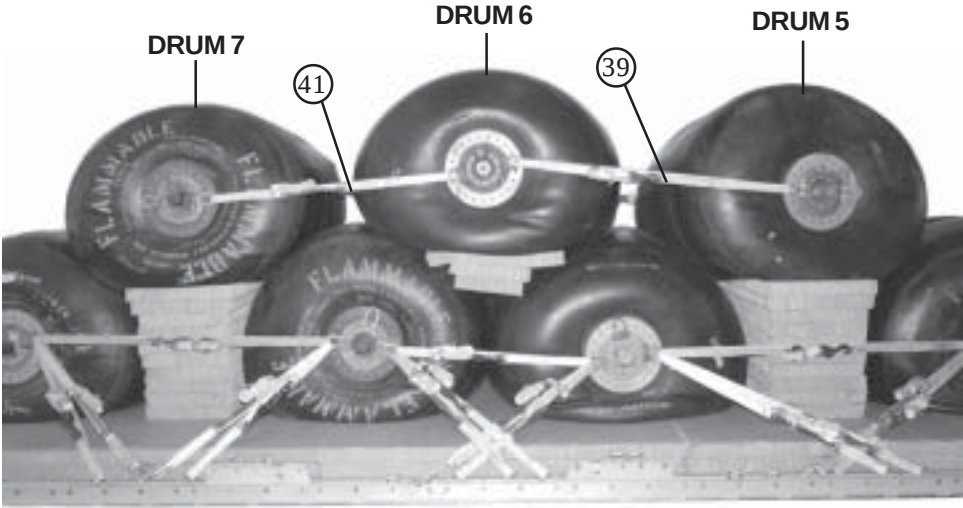
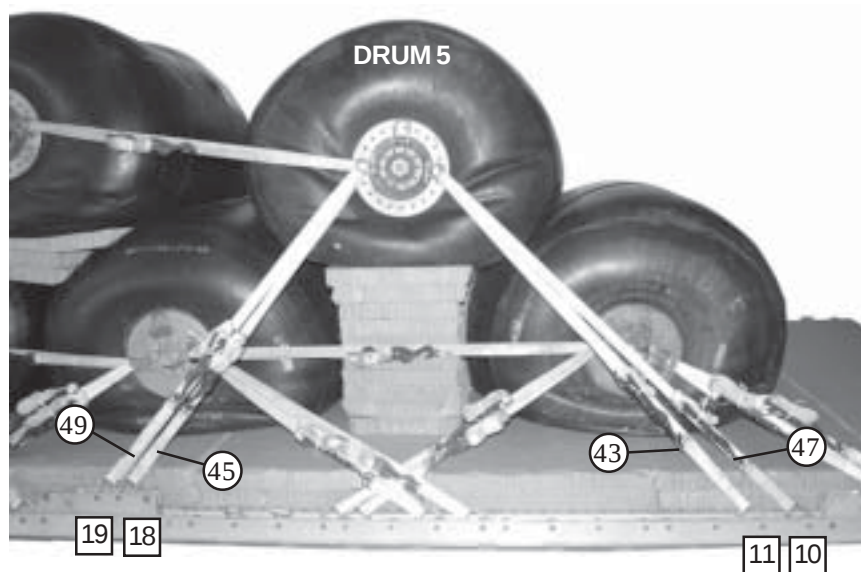
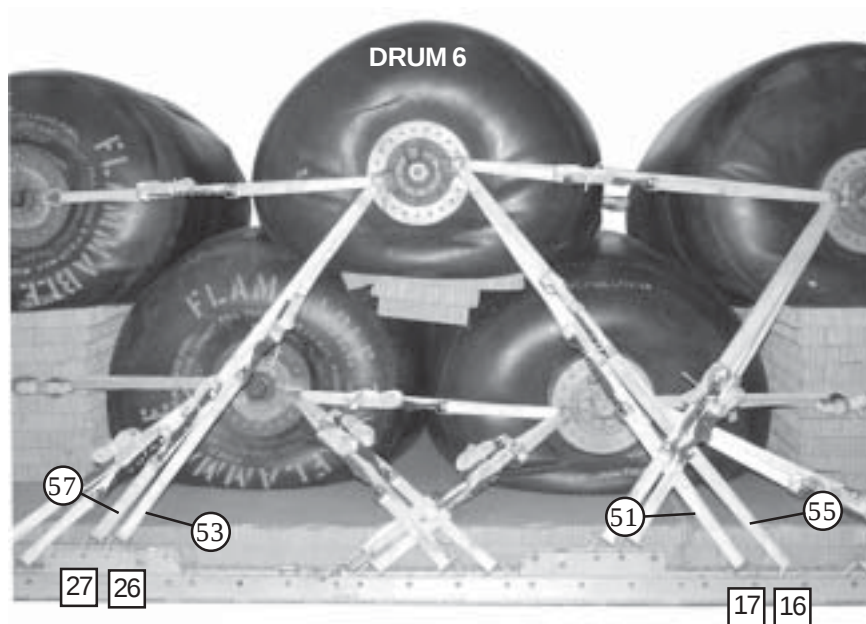
		
Lashing Number	Tie-down Clevis Number	Instructions
39		Route a lashing from the rear shackle of drum 5 to the front shackle of drum 6 on the right side.
40		Route a lashing from the rear shackle of drum 5 to the front shackle of drum 6 on the left side.
41		Route a lashing from the rear shackle of drum 6 to the front shackle of drum 7 on the right side.
42		Route a lashing from the rear shackle of drum 6 to the front shackle of drum 7 on the left side.

Figure 4-125. Lashings 39 through 42 Installed



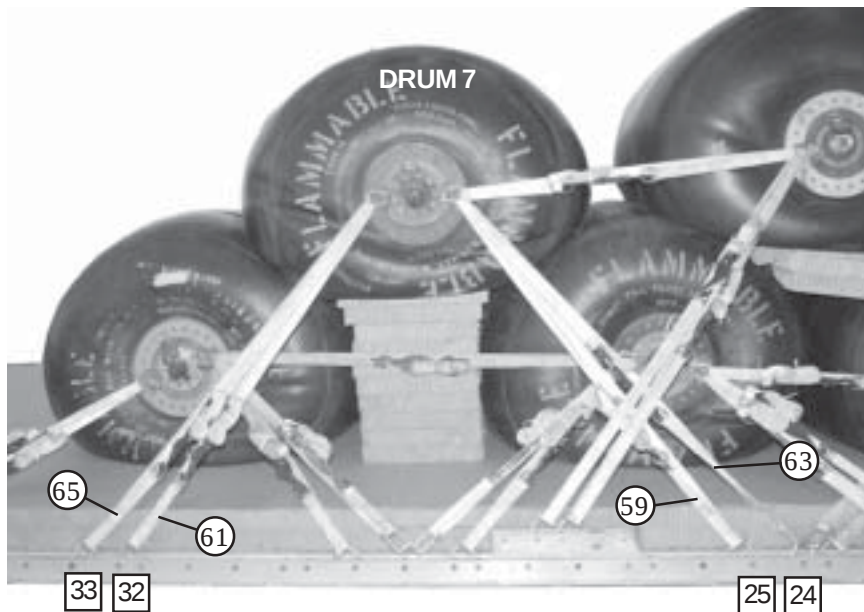
Lashing Number	Tie-down Clevis Number	Instructions
43	11	Route a lashing from clevis 11 to the front right shackle on drum 5.
44	11A	Route a lashing from clevis 11A to the front left shackle on drum 5.
45	18	Route a lashing from clevis 18 to the rear right shackle on drum 5.
46	18A	Route a lashing from clevis 18A to the rear left shackle on drum 5.
47	10	Route a lashing from clevis 10 to the front right shackle on drum 5.
48	10A	Route a lashing from clevis 10A to the front left shackle on drum 5.
49	19	Route a lashing from clevis 19 to the rear right shackle on drum 5.
50	19A	Route a lashing from clevis 19A to the rear left shackle on drum 5.

Figure 4-126. Lashings 43 through 50 Installed



Lashing Number	Tie-down Clevis Number	Instructions
51	17	Route a lashing from clevis 17 to the front right shackle on drum 6.
52	17A	Route a lashing from clevis 17A to the front left shackle on drum 6.
53	26	Route a lashing from clevis 26 to the rear right shackle on drum 6.
54	26A	Route a lashing from clevis 26A to the rear left shackle on drum 6.
55	16	Route a lashing from clevis 16 to the front right shackle on drum 6.
56	16A	Route a lashing from clevis 16A to the front left shackle on drum 6.
57	27	Route a lashing from clevis 27 to the rear right shackle on drum 6.
58	27A	Route a lashing from clevis 27A to the rear left shackle on drum 6.

Figure 4-127. Lashings 51 through 58 Installed



Lashing Number	Tie-down Clevis Number	Instructions
59	25	Route a lashing from clevis 25 to the front right shackle on drum 7.
60	25A	Route a lashing from clevis 25A to the front left shackle on drum 7.
61	32	Route a lashing from clevis 32 to the rear right shackle on drum 7.
62	32A	Route a lashing from clevis 32A to the rear left shackle on drum 7.
63	24	Route a lashing from clevis 24 to the front right shackle on drum 7.
64	24A	Route a lashing from clevis 24A to the front left shackle on drum 7.
65	33	Route a lashing from clevis 33 to the rear right shackle on drum 7.
66	33A	Route a lashing from clevis 33A to the rear left shackle on drum 7.

Figure 4-128. Lashings 59 through 66 Installed

BUILDING THE EQUIPMENT BOXES

4-81. Build the front and rear equipment boxes as shown in Figures 4-93 and 4-94.

PREPARING EQUIPMENT FOR EQUIPMENT BOXES

4-82. Prepare the fire extinguishers, filter separator, explosion proof motor, pumps, manuals and toolkit as explained and shown in paragraph 4-6. Using the lists printed on the equipment bags, place the equipment indicated on each list into its bag. Prepare and secure the battery box as shown in Figure 4-95.

POSITIONING EQUIPMENT BOXES

4-83. Prepare and position the front and rear equipment boxes as shown in Figures 4-96 and 4-97.

POSITIONING AND SECURING EQUIPMENT IN EQUIPMENT BOXES

4-84. Position and secure equipment in equipment boxes as shown in Figures 4-98 and 4-99.

LASHING THE EQUIPMENT BOXES TO THE PLATFORM

4-85. Lash the equipment boxes as shown in Figures 4-100 through 4-102 and Figures 4-129 through 4-131.

a. Lash the front equipment box to the platform as shown in Figures 4-100 through 4-102.

b. Lash the rear equipment box to the platform as shown in Figures 4-129 through 4-131.

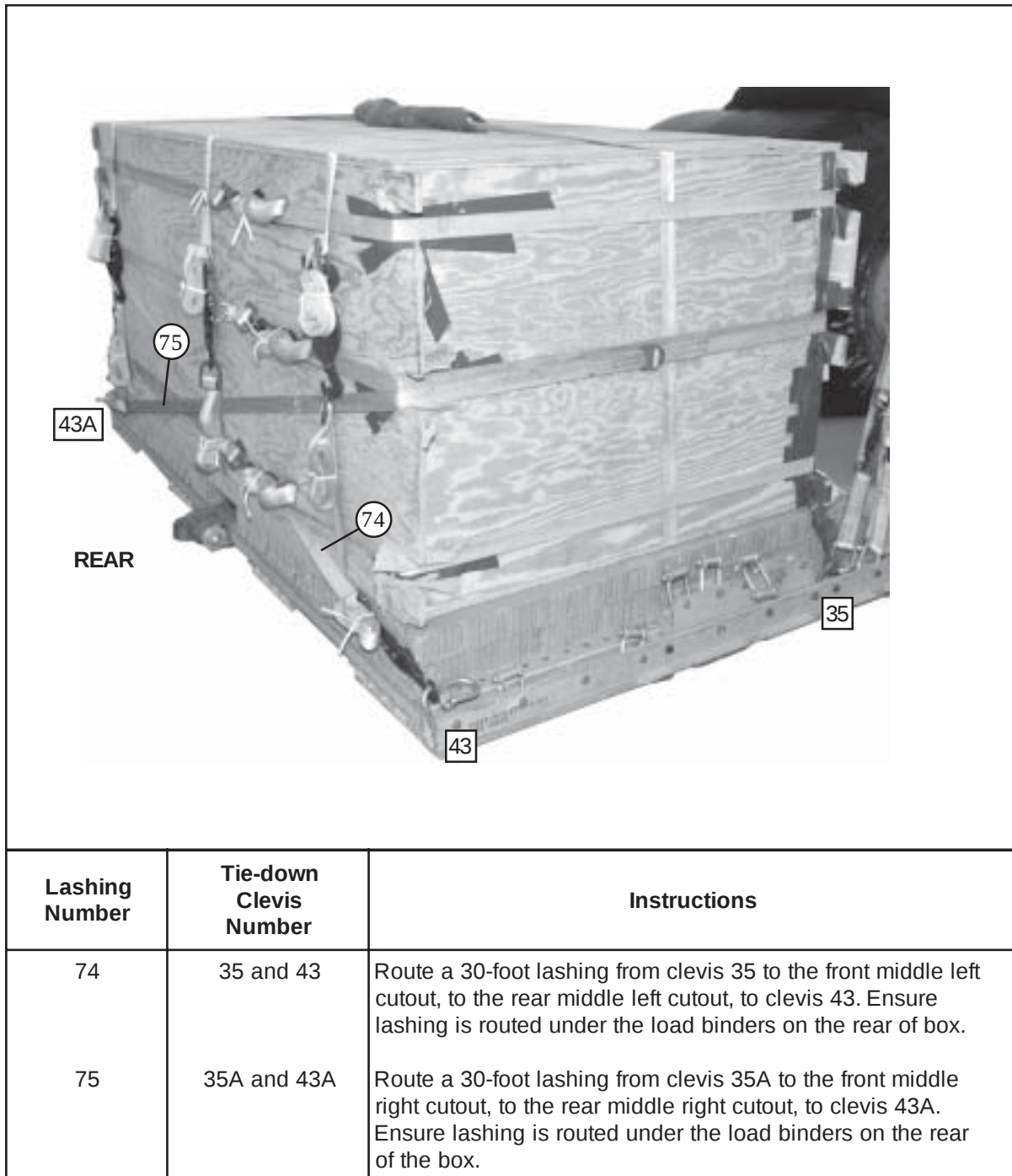


Figure 4-129. Lashings 74 and 75 Installed

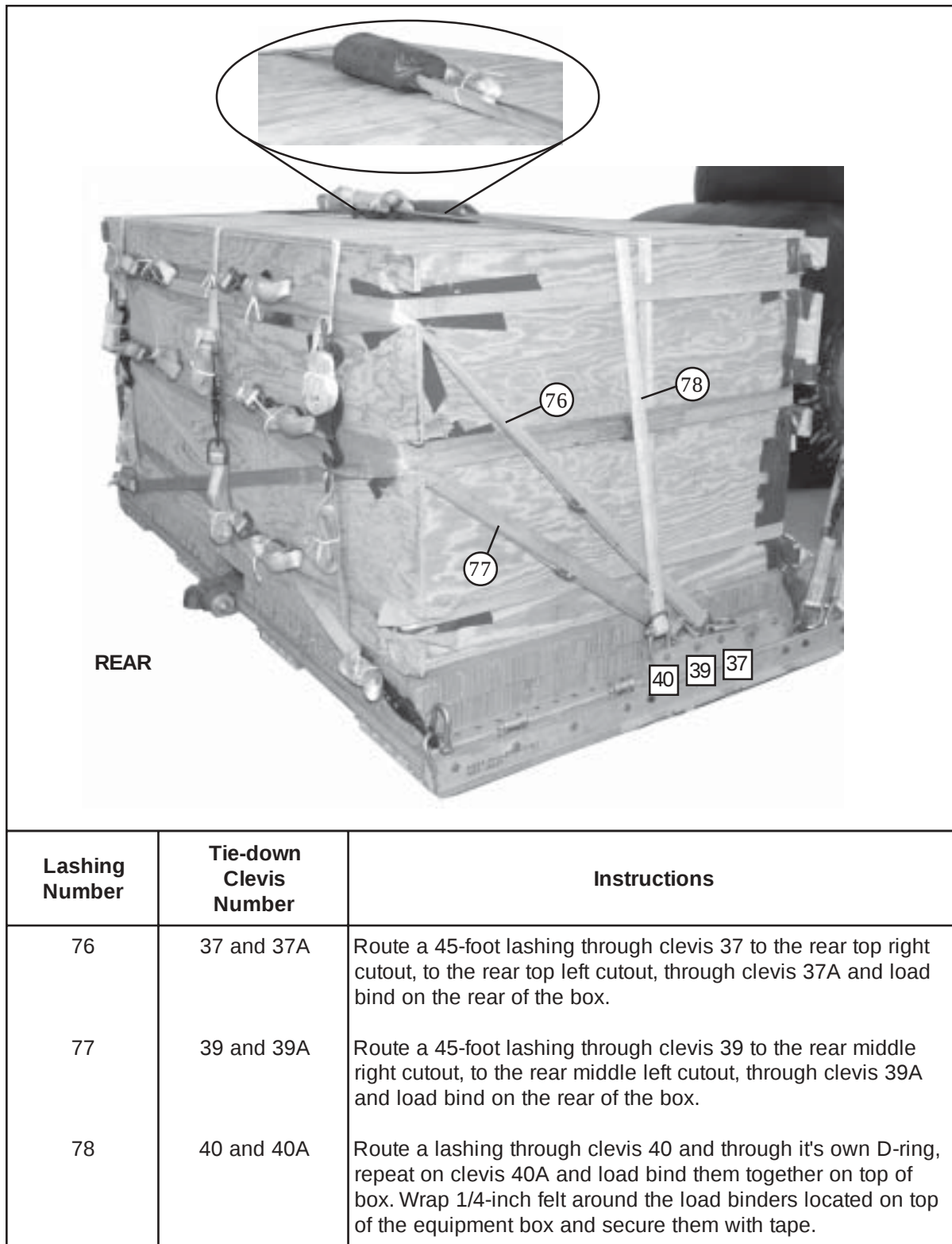
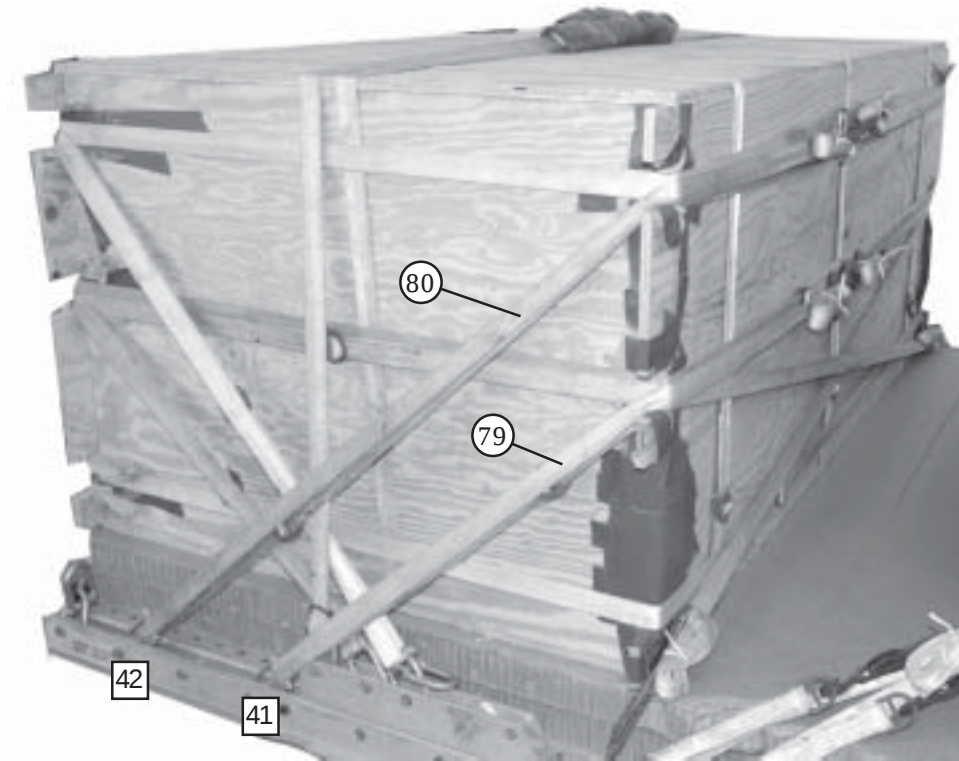


Figure 4-130. Lashings 76 through 78 Installed



Lashing Number	Tie-down Clevis Number	Instructions
79	41 and 41A	Route a 45-foot lashing through clevis 41 to the front middle right cutout, to the front middle left cutout, through clevis 41A and load bind on the front of the box.
80	42 and 42A	Route a 45-foot lashing through clevis 42 to the front top right cutout, to the front top left cutout, through clevis 42A and load bind on the front of the box.

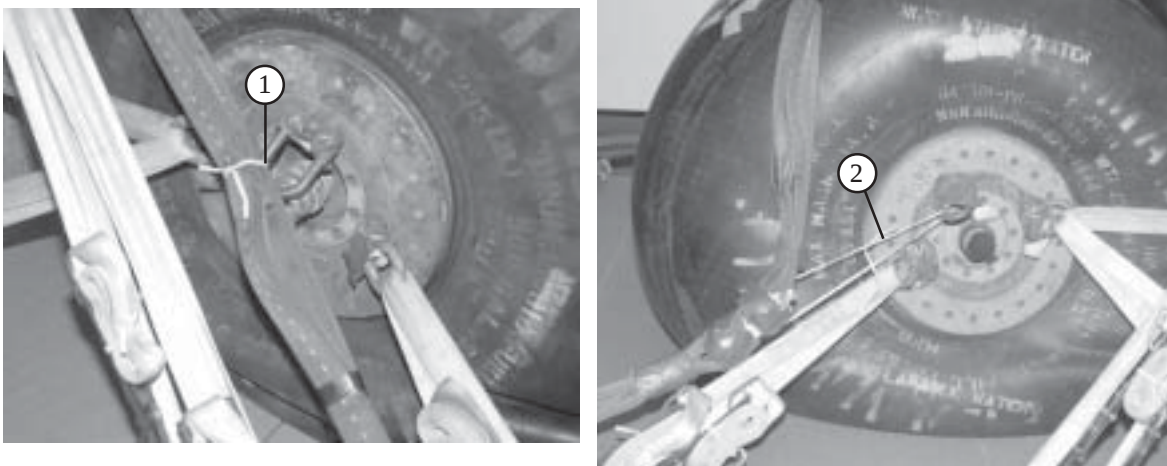
Figure 4-131. Lashings 79 and 80 Installed

INSTALLING SUSPENSION SLINGS AND SAFETY TIES

4-86. Install suspension slings as shown in Figure 4-107. Install the suspension sling safety ties as shown in Appendix A, to the front and rear suspension slings, six to eight inches above drum 1 and drum 4. (not shown)

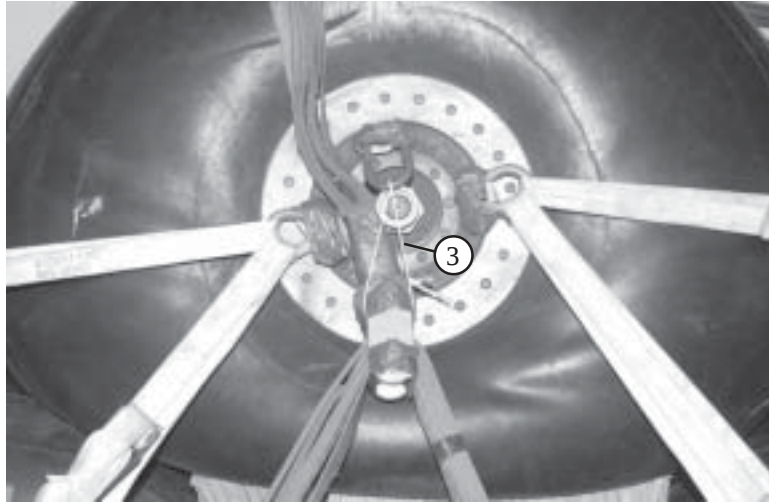
SECURING THE SUSPENSION SLINGS

4-87. Make the following suspension slings securing ties as shown in Figure 4-132.

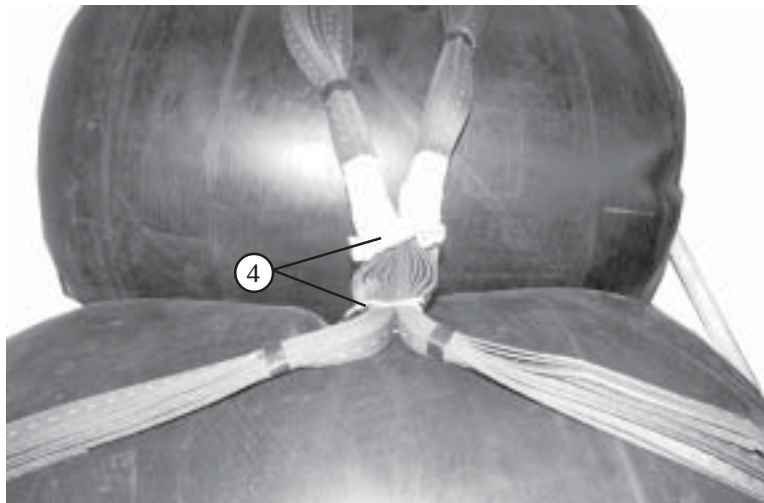


- ① Secure the front right suspension sling to the right side top shackle of fuel drum 1 with one turn single type I, 1/4-inch cotton webbing. Repeat for the left side.
- ② Secure the rear right 5 1/2-inch 2 point link to the right side top shackle of fuel drum 4 with one turn single type III, nylon cord. Repeat for the left side.

Figure 4-132. Suspension Slings Secured



- ③ Secure the center right 5 1/2-inch 2 point link to the right side top shackle on drum 6 with a single length of type III, nylon cord. Repeat for left side.



- ④ Secure the rear slings together on top of fuel drum 4 with one turn single type I, 1/4-inch cotton webbing. S-fold and secure the safety tie with masking tape.

Figure 4-132. Suspension Slings Secured (Continued)

PREPARING AND STOWING CARGO PARACHUTES

4-88. Prepare and stow seven G-11 cargo parachutes as shown in Figure 4-133.

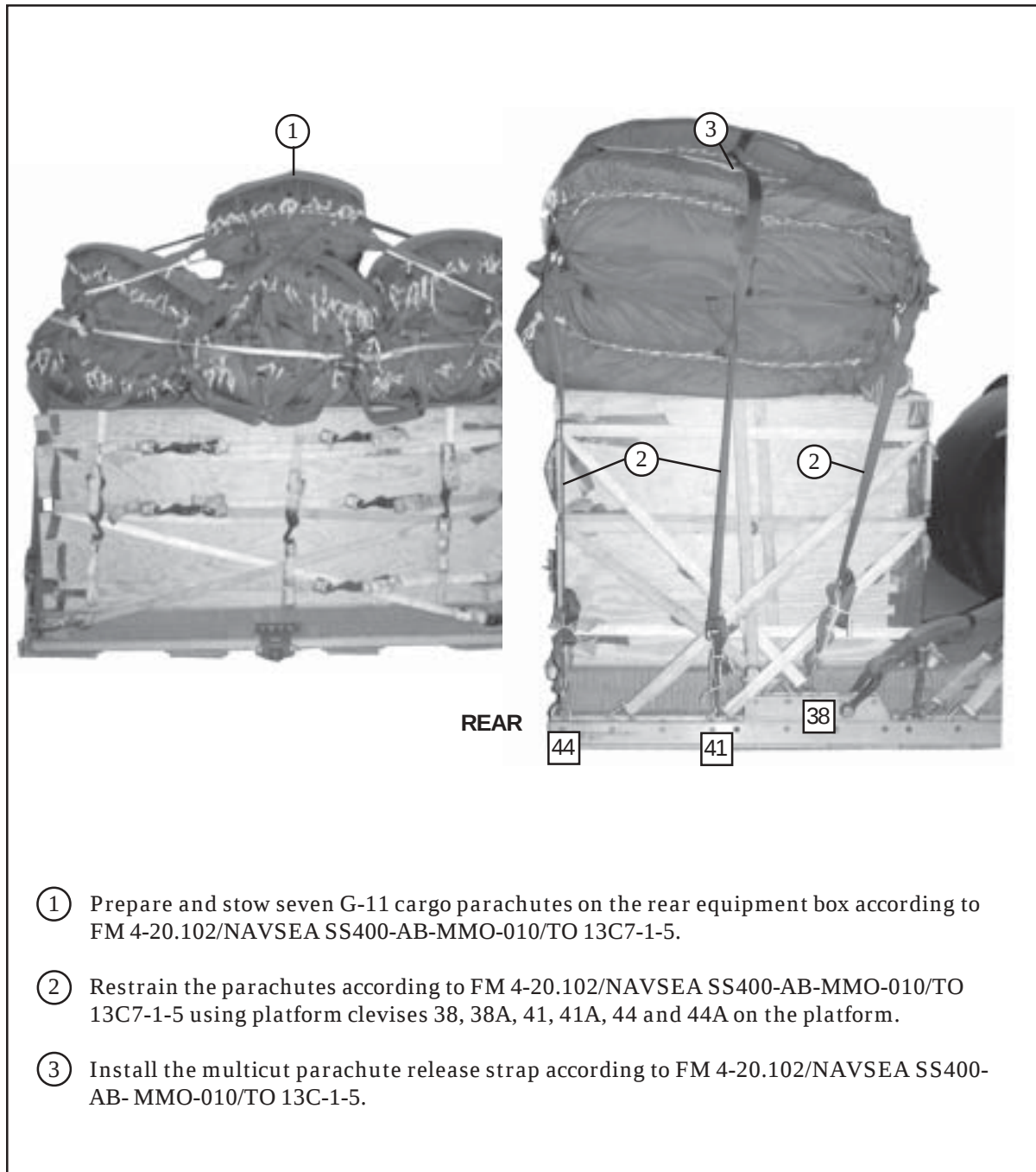


Figure 4-133. Cargo Parachutes Prepared and Stowed

BUILDING AND POSITIONING RELEASE PLATFORM

4-89. Build and position the release platform as shown in Figure 4-134.

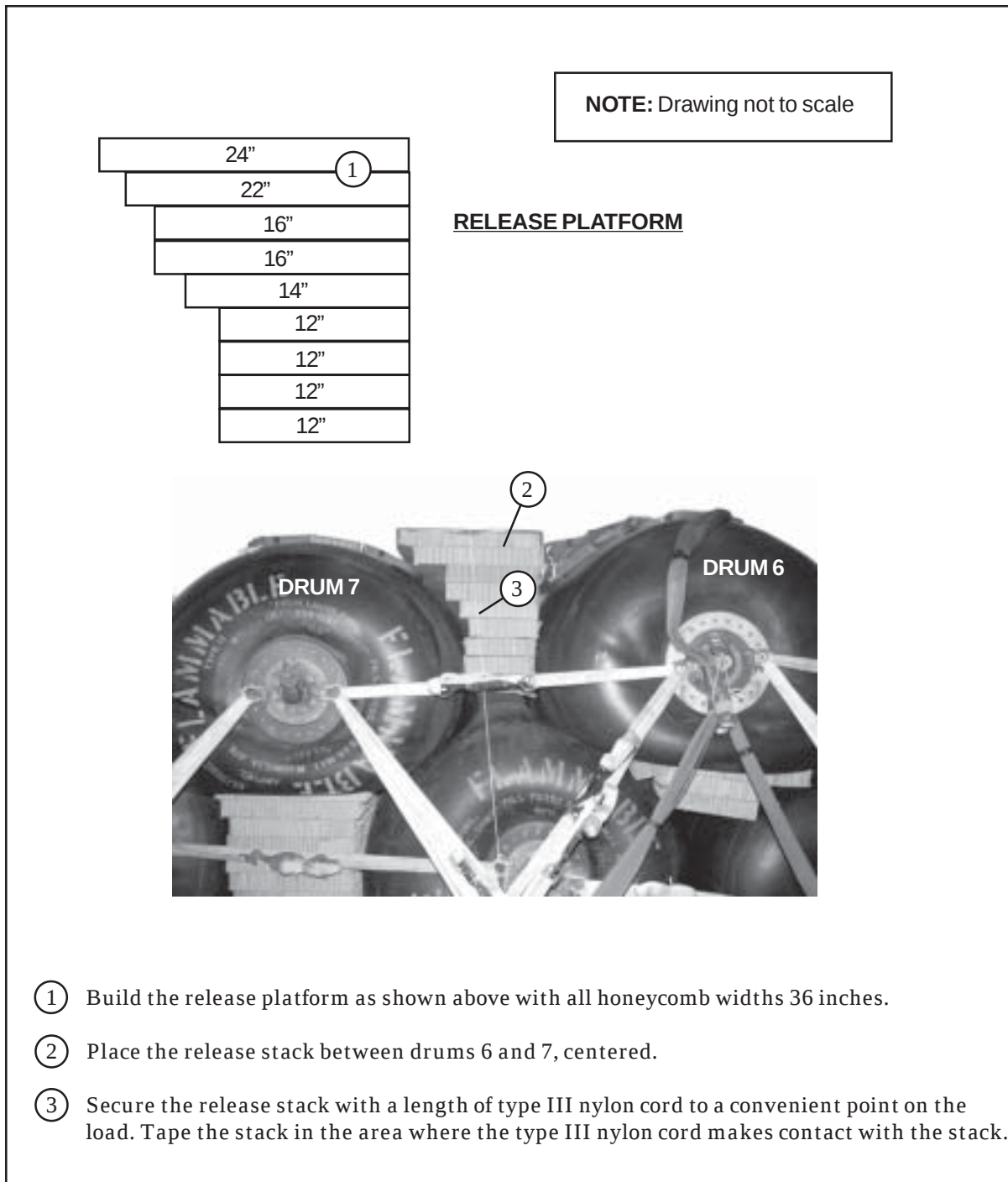


Figure 4-134. Release Platform Built and Positioned

INSTALLING THE EXTRACTION SYSTEM

4-90. Install the extraction system as shown in Figure 4-135.

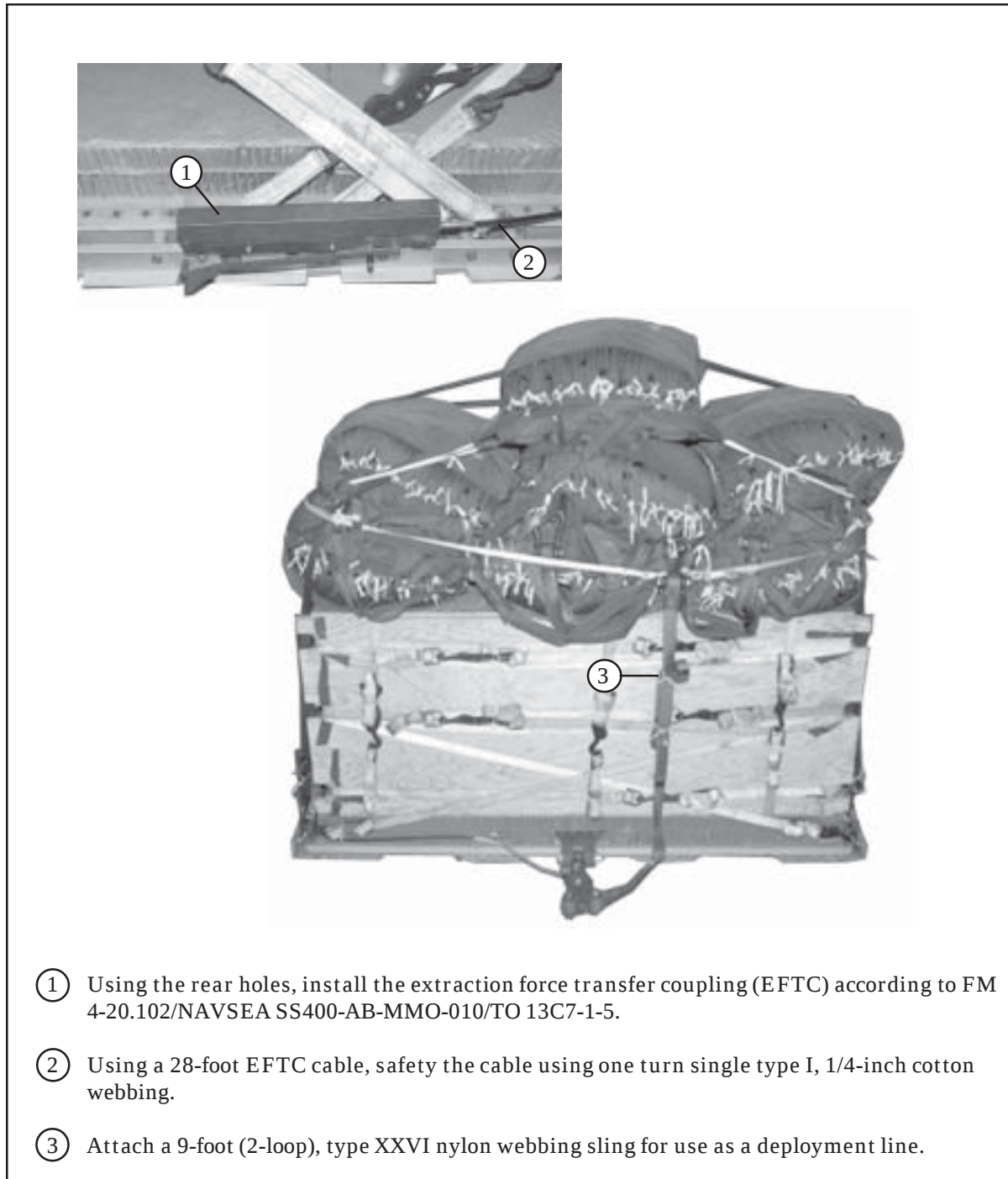
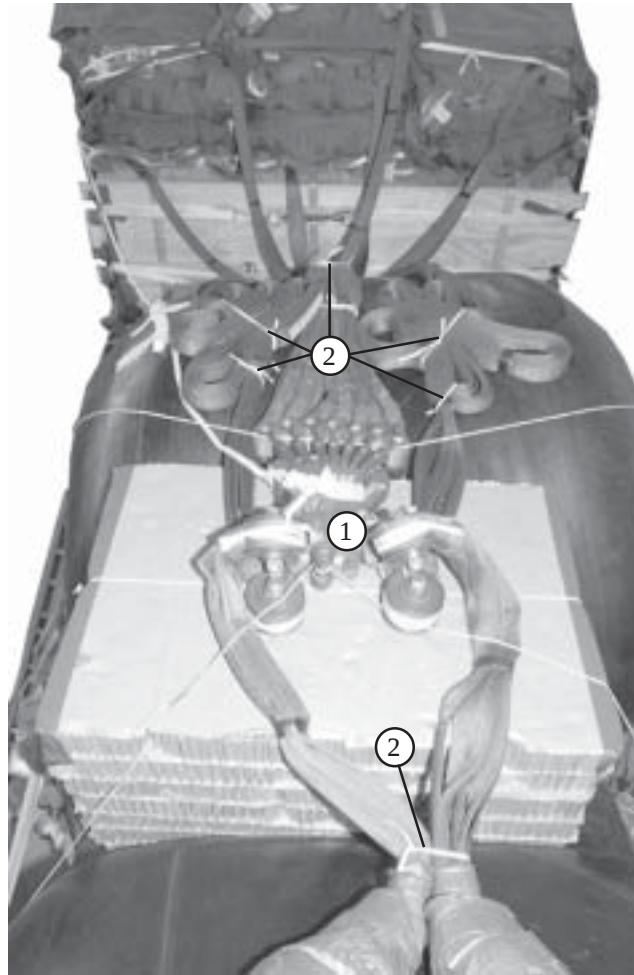


Figure 4-135. Extraction System Installed

INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-91. Install the M-2 cargo parachute release system as shown in Figure 4-136.



- ① Place the M-2 release on the release platform. Attach the suspension slings and the parachute riser extensions to the M-2 cargo parachute release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.
- ② Secure the excess suspension slings and parachute risers extensions with one turn type I, 1/4-inch cotton webbing.
- ③ S-fold and secure the front safety tie with paper tape (not shown).

Figure 4-136. Cargo Parachute Release Installed

PLACING EXTRACTION PARACHUTE

4-92. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

4-93. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

MARKING RIGGED LOAD

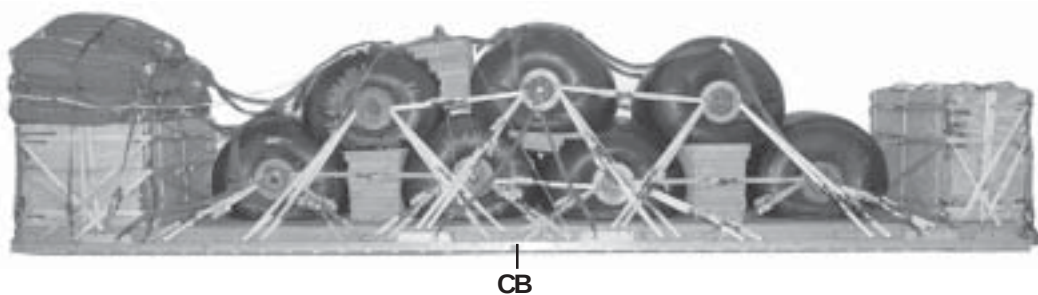
4-94. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-137. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

4-95. Use the equipment list in Table 4-6 to rig the load shown in Figure 4-137.

CAUTION

Make the final inspection required by FM 4-20.102/NAVSEA
SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves
the rigging site.

**RIGGED LOAD DATA**

Weight 36,480 pounds

NOTE: The rigged weight for this load is using water as the liquid. Use the weight conversion table for the actual rigged weight for any other liquids used.

NOTE: The G-11 requirements may need to be recomputed for lighter liquids.

Maximum Weight 36,750 pounds

Height 96 inches

Width 108 inches

Overall Length 402 inches

Overhang: Front 0 inches

Rear (EFTC) 18 inches

Center of Balance (CB) (from front edge of platform) 191 inches

Figure 4-137. AAFARS Rigged with Seven 500-Gallon Drums for Low-Velocity Airdrop

Table 4-6. Equipment Required for Rigging AAFARS With Seven 500-Gallon Drums

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	12
4030-00-678-8562	Clevis, medium	6
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-326-7309	Coupling assembly, airdrop, extraction force transfer w/ cable, 28-ft	1
1670-00-360-0328	Cover, clevis, large	7
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, parachute bag (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add1 for DES)	2
1670-01-064-4452	Line, drogue (for DES) 60-foot (1-loop), type XXVI	1
1670-01-064-4454	Line, extraction For C-130: 60-ft (6-loop), type XXVI	1
1670-01-062-6312	For C-141: 120-ft (6-loop), type XXVI	1
1670-01-062-6312	For C5: (between fuselage station 1667-1971) 120-ft (6-loop), type XXVI	1
1670-01-062-6312	(between fuselage station 947-1666) 120-ft (6-loop), type XXVI and a	1
1670-01-064-4454	60-ft (6-loop), type XXVI	1
1670-01-062-6312	(between fuselage station 574-947) 120-ft (6-loop), type XXVI	2
1670-01-468-9178	For C-17: 140-ft (6-loop), type XXVI	
	Link assembly:	
5306-00-435-8994	Two-point: (for DES) Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2

Table 4-6. Equipment Required for Rigging AAFARS With Seven 500-Gallon Drums (Continued)

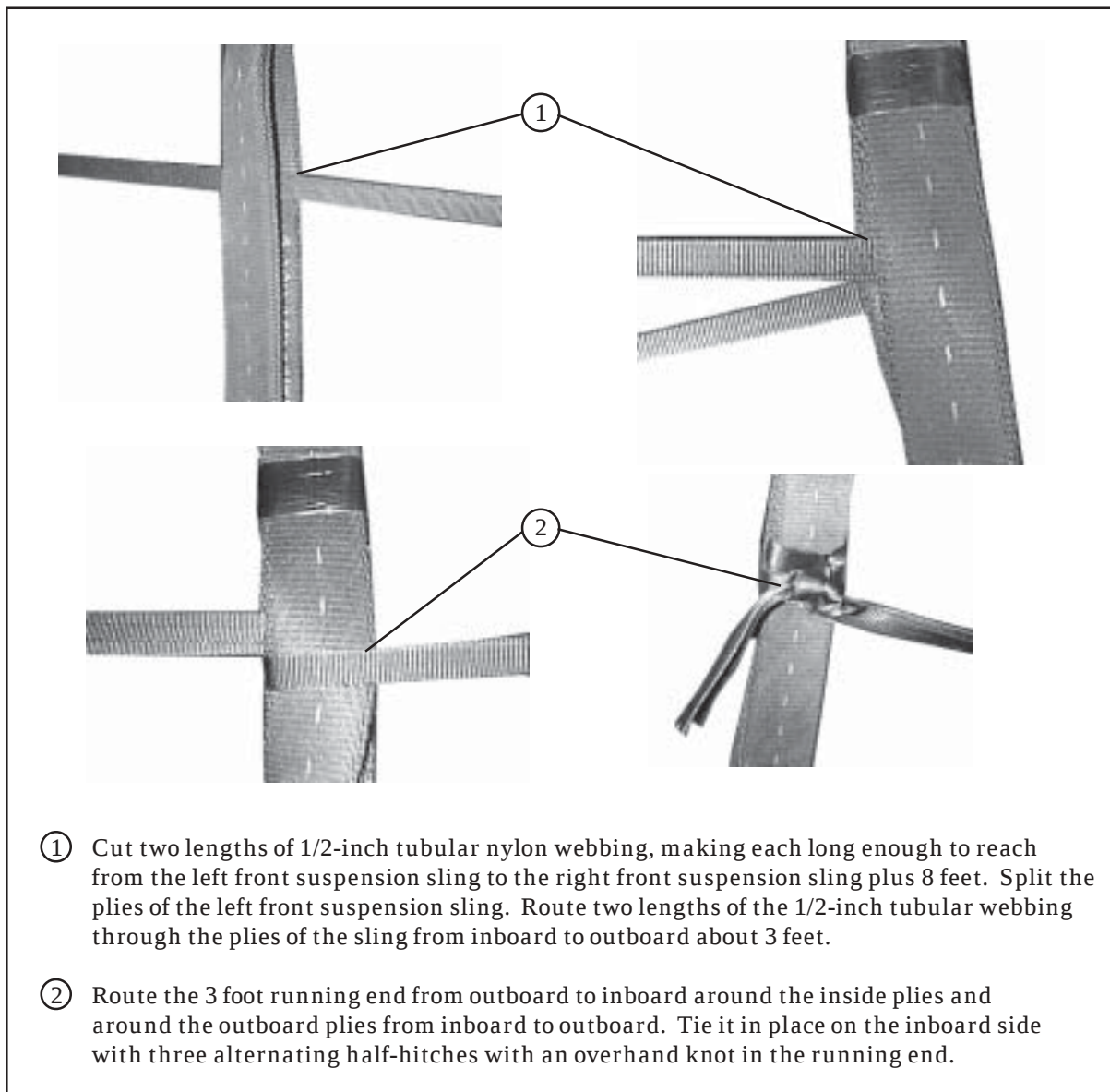
Table 4-6. Equipment Required for Rigging AAFARS With Seven 500-Gallon Drums (Continued)

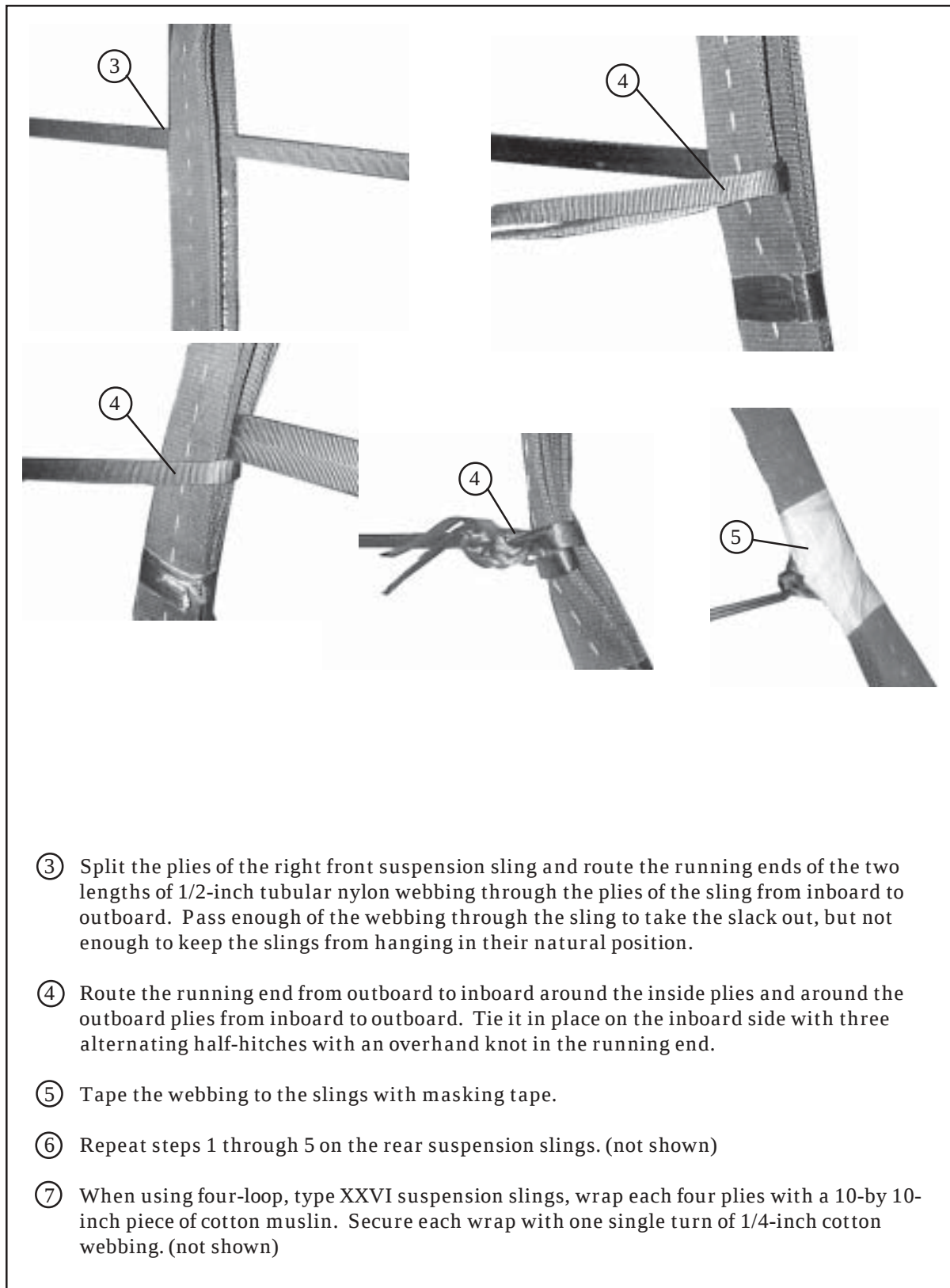
National Stock Number	Item	Quantity
1670-01-062-6304	For deployment: 9-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-6311	For riser extension: 120-ft (2-loop), type XXVI	7
5340-00-040-8219	Strap, parachute release, multicut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	128
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-260-6890	Type X	As required

Appendix A

INSTALLING SUSPENSION SLING SAFETY TIES

Installing the Suspension Sling Safety Ties keeps the suspension slings from making contact with the load. **The procedures in this Appendix are different from those in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. An exception to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 is granted. The procedures in this Appendix must be followed.** Safety tie the front and rear suspension slings according to instructions shown below.





Glossary

AAFARS	Advanced Aviation Forward Area Refueling System
AFB	Air Force Base
AFMAN(I)	Air Force Joint Manual
AFTO	Air Force Technical Order
AFSOC	Air Force Special Operations Command
ALC	Airlift Logistics Center
AMC	Air Mobility Command
CB	center of balance
d	penny
DA	Department of Army
DC	District of Columbia
DES	Drogue Extraction System
diam	diameter
EFTC	extraction force transfer coupling
FARE	forward area refueling equipment
FM	field manual
ft	foot/feet
GPM	gallons per minute
HMMWV	high mobility multipurpose wheeled vehicle
HQ	headquarters
in	inch
lb	pound
No	number

POL	petroleum, oils, and lubricants
TRADOC	US Army Training and Doctrine Command
USA	United States of America
TM	technical manual
TO	technical order

References

- AFR 55-40/AR 59-4** Joint Airdrop Inspection Records, Malfunction Investigations and Activity Reporting. 1 May 1998.
- *AFMAN(I) 24-204/TM 38-250** Preparing Hazardous Materials for Military Air Shipments. December 2001.
- **FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5** Airdrop of Supplies and Equipment: Rigging Airdrop Platforms. 22 August 2001.
- FM 4-20.117/TO 13C7-1-111** Airdrop of Supplies and Equipment: Rigging High-Mobility Multipurpose Wheeled Vehicles. 1 October 2001
- TM 9-2330-202-14&P** Operator's, Unit, Direct Support, and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for Trailer, Cargo, 3/4-Ton, 2 wheel M101A2, M1010 OIA3, Trailer, Chassis, 3/4-Ton, 2-Wheel M116A2, M116A2E1, Trailer, Chassis, 1-Ton, 2-wheel M116A3. May 1997
- TM 10-1670-268-20&P/TO 13C7-52-22** Organizational Maintenance Manual with Repair Parts and Special Tools List: Type V Airdrop Platform. 1 June 1986.
- TM 10-1670-277-23&P/TO 13C5-28-2/NAVAIR 13-1-30** Unit and Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 28-ft Diam, Cargo Extraction Parachute. 10 October 1990.
- TM 10-1670-278-23&P/TO 13C5-26-2/NAVAIR 13-1-27** Unit and Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 15-ft Diam, Cargo Extraction Parachute. 6 November 1989.
- TM 10-1670-279-23&P/TO 13C5-27-2/NAVAIR 13-1-28** Unit and Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 22-ft Diam, Cargo Extraction Parachute 30 August 1989.
- TM 10-1670-280-23&P/TO 13C5-31-2/NAVAIR 13-1-31** Unit and Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 100-ft Diam, Model G-11A, Model G-11B, and Model G-11C, 5 August 1991.
- *AFMAN(I) 24-204/TM 38-250 has superseded AFJMAN 24-204/TM 38-250 (25 November 1994).**
- ** FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 has superseded FM 10-500-2/TO 13C7-1-5 (1 November 1990).**

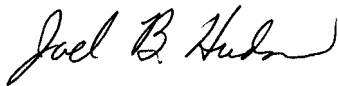
TM 10-1670-286-20/ TO 13C5-2-41	Unit Maintenance Manual for Sling/Extraction Line Panel (Including Stowing Procedures). 15 March 2001.
TM 10-1670-296-20&P/ TO 13C7-49-2	Unit Maintenance Manual Including Repair Parts and Special Tools List for Ancillary Equipment for Low-Velocity Airdrop Systems (LVADS). 15 September 1995.
AFTO Form 22	Technical Order Publication Improvement Report
DA Form 2028	Recommended Changes to Publication and Blank Forms. February 1974.
* Shipper's Declaration for Dangerous Goods	Locally Procured Form.
* Shipper's Declaration for Dangerous Goods has superseded DD Form 1387-2 (February 1982).	

FM 4-20.137 (FM 10-537)
TO 13C7-1-19
10 JUNE 2003

By Order of the Secretary of the Army and the Air Force:

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